PACKAGE engineering

What polyethylene does to wax coatings

Adding polyethylene to paraffin and microcrystalline waxes for paperboard coatings gives a tailoring of performance properties to provide effects not available with wax alone. (See Page 33)

Putting versatility into a bottle line

Developing one line to handle six bottle and three cap sizes requires coordination of standard machinery units with company-devised techniques of transferring and handling bottles. (See Page 39)

Matching product flow to packaging load

Using parallel conveyor belts to furnish supplies of a wet, irregular and slippery product (fish fillets) to line crews, and balancing their loads to assure efficient manual packaging. (See Page 56)

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DECEMBER 1959
VOLUME 4 • NUMBER 12

Package Engineering
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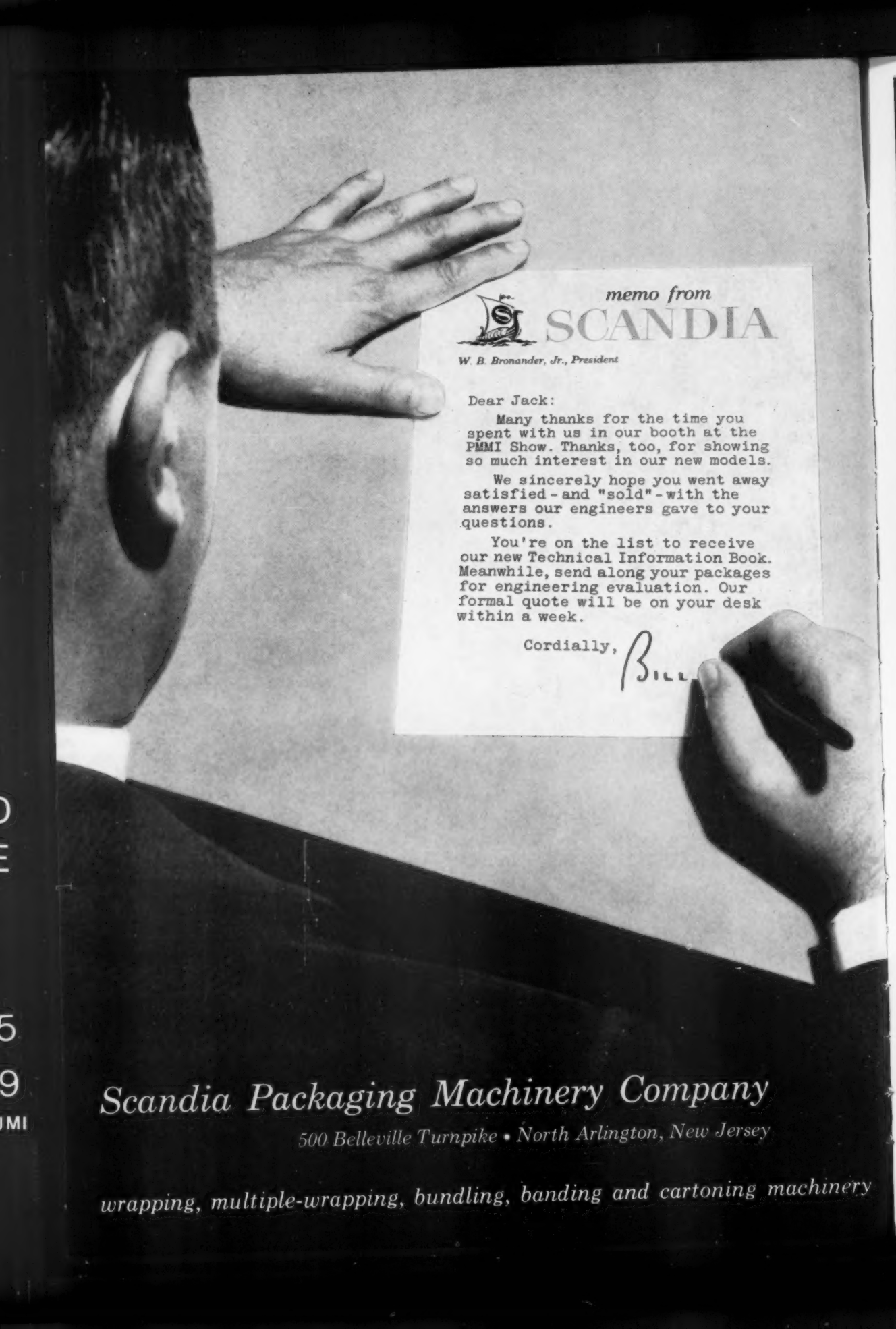
memo from
SCANDIA
W. B. Bronander, Jr., President
Dear Jack:
Many thanks for the time you spent with us in our booth at the PMMI Show. Thanks, too, for showing so much interest in our new models.
We sincerely hope you went away satisfied - and "sold" - with the answers our engineers gave to your questions.
You're on the list to receive our new Technical Information Book. Meanwhile, send along your packages for engineering evaluation. Our formal quote will be on your desk within a week.
Cordially,
Bill
Scandia Packaging Machinery Company
500 Belleville Turnpike • North Arlington, New Jersey
wrapping, multiple-wrapping, bundling, banding and cartoning machinery

Packaging machine — Model CKP-2 (Patent Pending) by Crompton & Knowles Packaging Corporation

Packaging Paper Plates?

Vitafilm *is just your dish!*

When it comes to packaging paper products, there is no transparent film on the market that does the job so well as VITAFILM.

Witness these smart and smoothly packaged paper plates made by Dixie Cup's* Kleen Products Division.

Snug wraps—strong, perfectly sealed, excellently transparent, dimensionally stable.

AND VITAFILM *doesn't attract dust* —always a real plus when merchandising containers for foodstuffs.

This great Goodyear film has a wonderful quality "feel," doesn't split or run — and today it is priced right on the button with the most common of the "low-priced three" in transparent films.

Printability is fine—and adaptability to high-speed packaging operations has been proved outstanding.

So with the price right and the performance unmatched, why wait? Get VITAFILM around your product—*the greatest thing you can place between you and your customer!*

Call your Goodyear Packaging Films Representative. Or write direct for details: Goodyear, Packaging Films Dept. L-6432, Akron 16, Ohio.

Vitafilm BY GOODYEAR

The finest in sheer protection

*A trademark of the Dixie Cup Division of American Can Company
Vitafilm, a Polyvinyl chloride—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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DECEMBER 1959 • VOLUME 4 • NUMBER 12

PACKAGE engineering

AN ANGUS J. RAY PUBLICATION

For your calendar

January 6-8, 1960. AMA orientation seminar on packaging foams and expanded plastics, Hotel Astor, New York, N.Y. Contact: John L. Wood, American Management Association, 1515 Broadway, New York 36, N.Y. *Telephone: JUdson 6-8100.*

January 17-20, 1960. 53rd Annual Exhibit of the Canning Machinery and Supplies Association, Americana Hotel, Bal Harbour, Florida. Contact: W. D. Lewis, Secretary-Treasurer, Canning Machinery & Supplies Association, 4630 Montgomery Avenue, Washington 14, D. C. *Telephone: OLiver 6-6979.*

January 18-20, 1960. 53rd Annual Convention of the National Canners Association, Americana Hotel, Miami Beach, Florida. Contact: R. F. Alexander, National Canners Association, 1133 20th Street, N. W., Washington 6, D. C. *Telephone: EXecutive 3-7030.*

February 8-10, 1960. 5th Military-Industry Packaging and Materials Handling Symposium, Sheraton Park Hotel. Washington, D. C. Contact: Lt. Colonel George A. Davies, Chief, Packaging Branch, Headquarters, USAF, Room 4312, Munitions Building, Washington 25, D.C. *Telephone: LIberty 5-6700, Ext. 6-2956.*

April 4-7, 1960. AMA National Packaging Conference, Shelbourne Hotel, Atlantic City, N. J. Contact: John L. Wood, American Management Association, 1515 Broadway, New York 36, N.Y. *Telephone: JUdson 6-8100.*

April 4-7, 1960. 29th AMA National Packaging Show, Convention Hall, Atlantic City, N.J. Contact: John L. Wood, American Management Association, 1515 Broadway, New York 36, N.Y. *Telephone: JUdson 6-8100.*

May 15-19, 1960. 20th Annual Meeting of Institute of Food Technologists, Masonic Memorial Temple, San Francisco, Calif. Contact: Institute of Food Technologists, 176 W. Adams St., Chicago 3, Ill. *Telephone: ANdover 3-5492.*

October 31-November 2, 1960. 22nd Annual National Packaging Forum of the Packaging Institute, Statler-Hilton Hotel, New York, N.Y. Contact: Charles A. Feld, executive director, Packaging Institute, 342 Madison Avenue, New York 17, N.Y. *Telephone: MUrray Hill 7-8875.*

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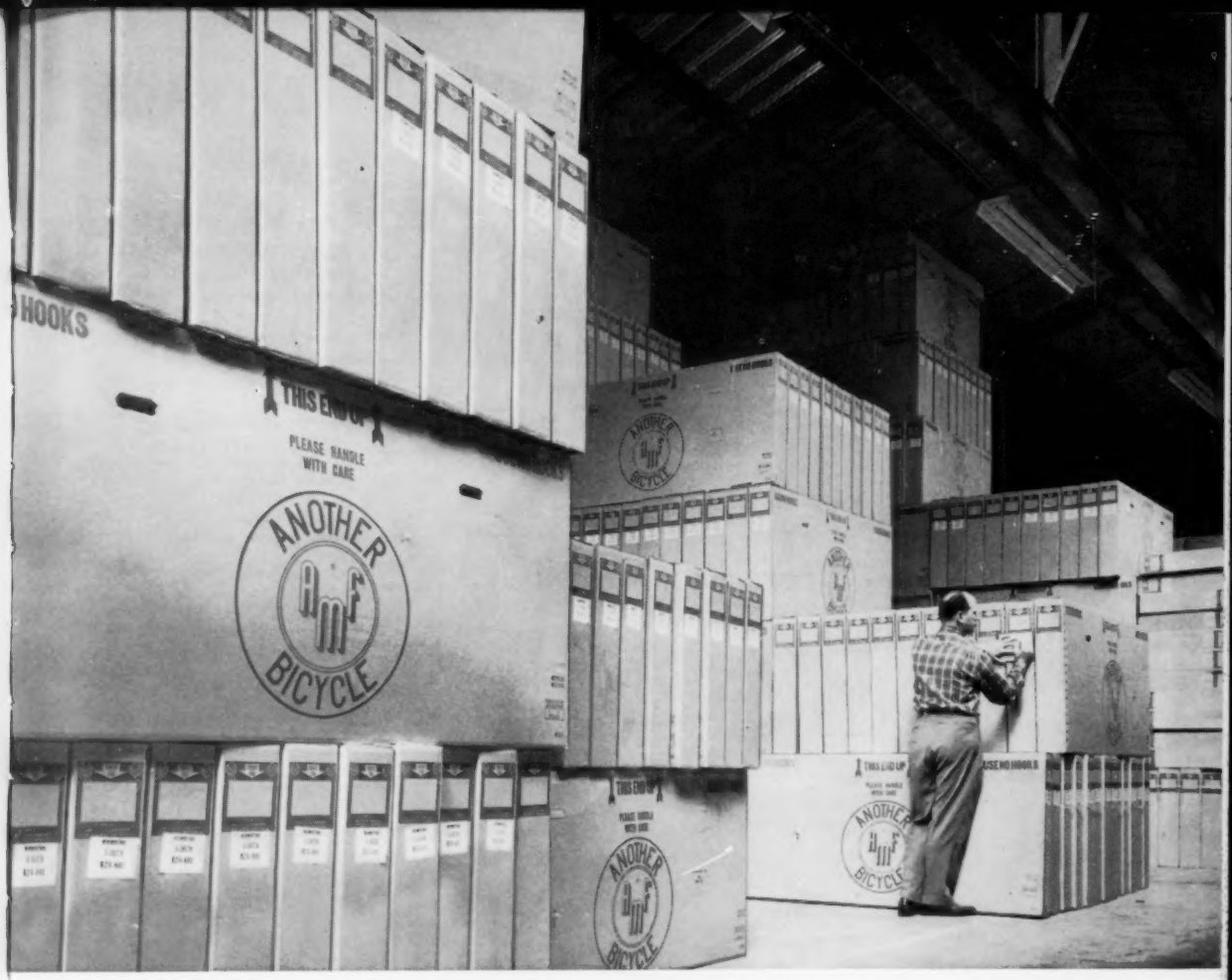

Warehouse at American Machine and Foundry Company's AMF Cycle Division plant, Little Rock, Arkansas

HOERNER-DESIGNED CORRUGATED CONTAINERS

CUT STORAGE COSTS...PROVIDE GREATER SHIPPING PROTECTION

One of the problems facing the American Machine and Foundry Company's Cycle Division plant at Little Rock, Arkansas, was storage. The space was there but the cartons in which they shipped their high quality bicycles were not strong enough to allow stacking more than 12 feet high. After that the containers were prone to collapse.

Another problem was shipping damage. The inner packing of the old cartons did not hold the bicycles securely in place during shipment.

A Hoerner Packaging Engineer* was called in from Hoerner's nearby Little Rock Plant. Working closely with AMF personnel, he designed a new carton that solved the storage space problem and provided greater protection of AMF bicycles in shipment.

A new inner packing was the answer. It provided additional strength and securely braced the bicycle against loose movement in transit.

The added strength of the new containers means AMF can now stack their bicycles up to the warehouse ceiling which is 20 feet high. This increased storage by approximately 40% — eliminated the cost of leasing warehouse space outside the AMF plant.

The new inner packing also braces the bicycles snugly inside the carton. They cannot move around in shipment. Eliminates customer rejects due to shipping damage. Also, the same pieces of inner packing can be used on all AMF bicycles regardless of cycle or outer carton size . . . saves AMF time in carton assembly and packaging.

HOW A HOERNER PACKAGING ENGINEER CAN HELP YOU

If you package things, call the Hoerner plant nearest you. A Packaging Engineer will study your operation without obligation. He can increase your profit margin by reducing labor and material costs and shipping losses. All through improved packaging with corrugated. Call today.

*Packaging Engineer responsible: Dick Troll; Designer: Gene Carter

HOERNER BOXES, INC.

Corrugated Specialists for Mid-America

GENERAL OFFICES: 600 Morgan St., Keokuk, Iowa. **PLANTS:** Fort Smith and Little Rock, Arkansas; Des Moines, Keokuk, and Ottumwa, Iowa; Minneapolis, Minnesota; Sand Springs, Oklahoma; Sioux Falls, South Dakota; Fort Worth, Texas. **AFFILIATE:** Cajas y Empaques Impermeables, S.A. Mexico City D.F., Mexico

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PACKAGE engineering®

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BPA

A note from the Publisher

PI's professional award

Dr. Frank C. Campins, president of Polymer Industries, Inc. received the coveted Professional Award of the Packaging Institute at its 21st Annual National Packaging Forum just concluded.

He was the third person to receive the award. Charles A. Southwick, Jr. received it in 1958 and Karl A. Prindle was the first person to be so honored when the first presentation was made at the 1957 Packaging Institute Forum.

This award is presented annually to the individual who, because of his pre-eminence in, and contribution to, the field of packaging technology, is deemed worthy of special recognition.

Dr. Campins has been associated with the packaging field for many years. While his contributions to the adhesive industry have been many, I know him best for the generous giving of his time to various industry associations. He is a member of the Technical Association of the Pulp and Paper Industry, The American Institute of Chemical Engineers, is chairman of the education committee of the Packaging Institute, and carries an active role in the development of PI's professional membership program.

Because of his interest in packaging education, he has contributed editorial features to PACKAGE ENGINEERING and other publications. He frequently appears on the speakers' platform at various industry meetings. His interest in packaging education has led to some lively discussions between him and our editors during the past few years.

His ideas of what a magazine like PACKAGE ENGINEERING should do editorially to fulfill its function as a medium of continuing adult education have always been helpful, and frequently provocative when his ideas range off into the future.

PACKAGE ENGINEERING congratulates Dr. Campins on joining the exclusive club that now numbers three, Mr. Southwick, Mr. Prindle, and himself, who have received the Professional Award of the Packaging Institute.

Angus J. Ray

Publisher

TALK ABOUT TROUBLE-FREE, HIGH SPEED PACKAGING...

1/150th of a minute is all it takes to wrap a cigarette pack in AVISCO® CELLOPHANE

Every cigarette manufacturer relies on cellophane for packaging. And no wonder! It's the *only* low cost film that performs at such tremendous speeds on cigarette wrapping machines. What's more, its potential speed of *300 packs a minute* is available whenever cigarette manufacturers want faster packaging. For cellophane is rigid and static-free. It feeds and forms perfectly. And it seals quickly and securely. But that's not all. Cellophane is unmatched for protecting the freshness, flavor and aroma that's so important in *keeping* cigarettes sold. Avisco cellophane, in particular, offers exceptional protection of this type because of constant advances in its moisture control properties. Also, cellophane is a sparkling, transparent showcase that invites people to look and buy. Regardless of your product, if it's packaged (or should be packaged) decide on cellophane. We offer a complete packaging service to assist you and demonstrate how Avisco cellophane, plain or printed, will answer your requirements better and more economically than any other packaging film. Phone or write us for an appointment with our representative in your area or a selected cellophane converter specializing in your field.

AVISCO®

AMERICAN VISCOSE CORPORATION, FILM DIVISION, 1617 PENNSYLVANIA BLVD., PHILADELPHIA 3, PA.

The PULSE / of packaging

Trends to watch:

The age of electronic cooking is "fast approaching" and will have "a profound effect" on the packaging of food products, says **Kaiser Aluminum and Chemical Corp.** It says cooking by electronic methods can be controlled with precision, is designing packages with different openings to provide varying rates and locations of heat transmission . . . Demand for corrugated shipping containers will double in 15 years and will average 4.14 billion sq. ft. a week by 1975, the **Econometric Institute** told **Fibre Box Association.** Reports to FBA indicate that 1959 fibreboard box shipments averaged 2.08 billion sq. ft. a week, 11 per cent above 1958 shipments, and predict that 1960 shipments will increase 5 per cent to be 2.18 billion sq. ft. a week.

Noting that today there are 75 different types and shapes of aerosol containers (compared with just two stock containers ten years ago), **G. Barr and Co.**, Chicago aerosol loader, predicts availability of at least 150 containers by 1965, observes that the latest major trend is an aluminum container which can be drawn into many shapes and which provides functional protection for water-based products.

Small companies continue to use resourcefulness to solve problems for which they lack adequate research facilities: **Tappan Zee Surgical Co.**, Bayville, N. J., faced with excluding air and moisture from its unprotected silver nitrate points, found a way to use a polyethylene coating inside a paper tube, says the combination has worked fine. This small company is now experimenting with specially-made tools for the quick tightening of paper tube bottoms.

Groups in the news:

Commodity Standards Div. of the **U. S. Department of Commerce** says that its commercial standard to be designated Polyethylene Film CS227-59 becomes effective November 15, 1959. Originally requested by the **Society of the Plastics Industry, Inc.**, the standard has been modified and adjusted to meet requirements of various interests concerned with polyethylene film . . . **American Management Association** has conferred its highest honor, the Distinguished Service Award, on C. Lee Rumberger, H. J. Heinz Co. This was in recognition of his service as vice president of AMA's packaging division.

The **Parenteral Drug Manufacturers Association** devoted part of a recent meeting to study of the semantics of procurement specifications, learned from a supplier expert that the packaging field lags behind other industries in procurement specifications. One speaker (George M. Scattergood, Armstrong Cork Co.) warned the PDMA that new methods are creating new words and that these require improved meanings in order to improve and pin down details of packaging specifications.

Packaging across the seas:

The **Irish Packaging Institute** organized earlier this year now has 120 member firms, expects to raise packaging standards and improve export goods packaging . . . A Dutch machinery manufacturer has introduced a bag sealing machine that is not limited to a maximum width and which uses two heat-resistant V-belts to lead bags through—and with bags (weighing up to 11 lb.) in free suspension.

Owens-Illinois Glass Co. has established a senior post-doctoral research fellowship at the University of Cambridge, expects that the research fellow will study friction of glass against metal at elevated temperatures, crystallization phenomenon at glass surfaces, or changes in surface structures due to changing environment of the glass sample.

European Packaging Federation's "Eurostars" competition committee reports that seven countries share 29 awards, judges chose the winners from 80 entries, all of which had already won awards in national competitions within their respective countries. EPF says its congress to be held at the Interpack (Dusseldorf in April, 1960) will focus on European aspects of packaging problems and their solution, and will have three main categories: (1) consumer packs, (2) transport packages, and (3) packaging machinery.

The Dow Chemical Co. is forming a wholly-owned subsidiary to manufacture polystyrene plastic in Greece, and will build a plant to cost in excess of $1 million.

More expansion for packaging:

Olin Mathieson Chemical Corp. has transferred its corrugated container facilities from Essexville, Mich. to its new plant in Owosso, Mich. . . . Completion of its new sheet plant in Tupelo, Miss. is announced by **Hoerner Boxes, Inc.** . . . **Visking Co.**, division of **Union Carbide Corp.**, will expand its facilities for producing cellulose sausage casings at Loudon, Tenn.

To house its expanding subsidiary, **U. S. Packaging Corp., Rap-In-Wax** has purchased a 50,000-sq. ft. building in South Hackensack, N. J. . . . **Continental Can Co.** plans to double the capacity of its Los Angeles corrugated box plant . . . A 50 per cent expansion in "Vitafilm" production facilities is planned by **The Goodyear Tire & Rubber Co.**

Construction has started on **St. Regis Paper Co.'s** $1.5-million bag plant near Los Angeles, Calif. . . . A New York combination sales and service center has been opened by the **Hayssen Manufacturing Co.**

U. S. Industrial Chemicals Co. plans to increase its production capacity of "Petrothene" polyethylene resins by 50,000,000 lb. a year. The expansion will take place at the Houston plant . . . **Kartridg-Pak Machine Co.** and its **Mojonnier Associates Div.** are now known as **Kartridg Pak Co.**

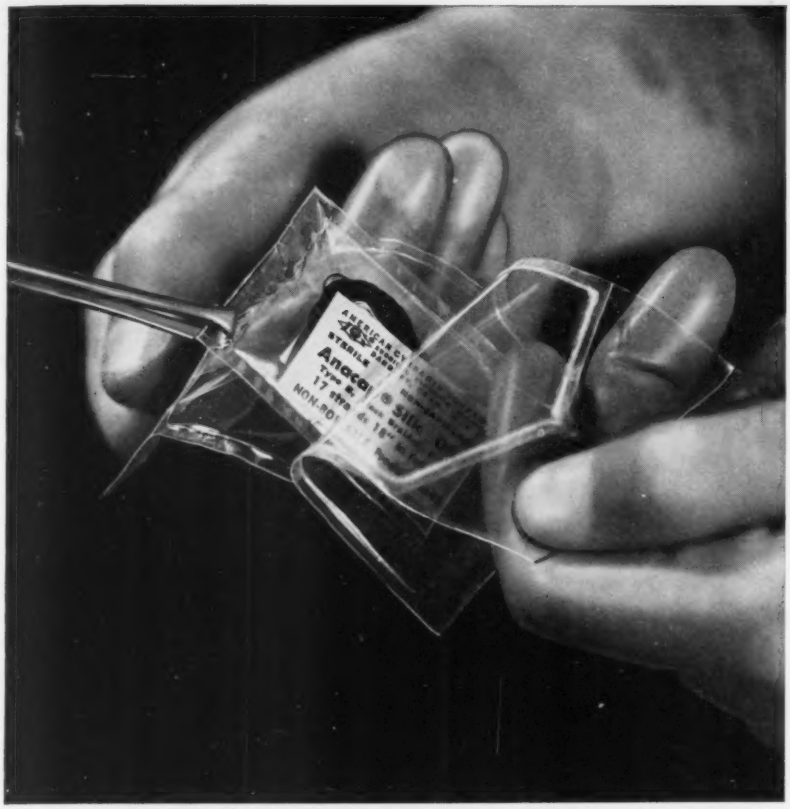
Just south of Minneapolis-St. Paul, **Brockway Glass Co., Inc.** will build a multi-million dollar glass-container manufacturing plant . . . **Crown Zellerbach Corp.** is constructing a chemical complex at Bogalusa, La., for the manufacture of industrial chemicals derived from the kraft pulping process.

Berles Carton Co., Inc. has opened new sales development headquarters in New York City . . . A 2,500-sq. ft. general office area will be built by **Crowell Carton Div.** of **St. Regis Paper Co.** at Marshall, Mich.

Packaging dollars and cents:

Crown Zellerbach Corp.'s earnings for the first nine months of 1959 were $28,966,000, a 24 per cent increase over the same period in 1958. Sales reached $393,077,000, a 14 per cent increase . . . For the first nine months of 1959, **Container Corp. of America** reports net earnings of $12,750,000, compared to $10,693,000 for the same 1958 period, and sales of $210,004,000, compared with $191,878,000 for the 1958 period.

Olin Mathieson Chemical Corp.'s net profits for the first nine months of 1959



SEALED IN ALCOHOL, sterile sutures stay sealed for as long as 3 years in envelopes of "Scotchpak" Brand Heat-Sealable Polyester Film. Paks can be stripped open easily in the operating room—and there's no danger from broken glass.

"SCOTCHPAK" TAKES OVER

...streamlines a multitude of packaging jobs!

Looking for a film that's *tough*, clear as glass—one you can freeze or boil? And would you like that same film to be heat-sealable with a seal that's as tough as the film itself? Then your answer is "Scotchpak."

Here is a film that combines the best features of many films. It can be heat-sealed in less than 2 seconds —a temperature of 300° to 400° F. and 20-60 psi is all that's required.

"Scotchpak" Film resists freezing cold (down to -70°F.) and boiling heat (up to 240°F.). It resists acids, oils, alkalies and organic solvents. It is light (saves shipping costs!) and compact (saves space in shipping and on the shelf, too!)

"Scotchpak" is now available in roll-stock widths up to 50 inches—from 2 mils to 4.5 mils thick, ready for printing—if you desire. It can be easily handled on conventional bag-making and filling equipment.

Our Customer Service organization is ready to work with you to show you how "Scotchpak" can solve your film fabrication and packaging problems. For complete information, write Film Products Group, Dept. CAS-129, 3M Company, St. Paul 6, Minnesota.

SCOTCHPAK BRAND

SCOTCHPAK BRAND

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HEAT-SEALABLE POLYESTER FILM

SCOTCHPAK BRAND

"SCOTCHPAK" IS A REGISTERED TRADEMARK FOR THE HEAT-SEALABLE POLYESTER FILM OF 3M CO., ST. PAUL 6, MINN. EXPORT: 99 PARK AVE., NEW YORK 16. CANADA: LONDON, ONTARIO

MINNESOTA MINING AND MANUFACTURING COMPANY

...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

I. J. GRASS NOODLE CO. DOUBLES PACKAGE PRODUCTION with HAYSSEN COMPAK

The I. J. Grass Noodle Company, Chicago, Illinois, uses the above Hayssen Compak to automatically package their famous chicken and vegetable soup concentrates at continuous production speeds of 124 packages per minute. The 2¼" x 4" bag is a part of the complete dry soup package. This production rate is twice that of their former semi-automatic method and is accomplished with half the labor force. Another example of how you save with Compak.

Plant Superintendent William Fieroh has this to say about Compak:

- **HI SPEED** – Our Compak, on a regular two shift day produces 7,440 packages of concentrate at the rate of 124 packages per minute.
- **DEPENDABILITY** – The Hayssen Compak handles all films regardless of film variations in thickness or coating. Compak continues to produce high quality packages without nuisance adjustments or shutdown time throughout our two shifts.
- **ECONOMY** – A plus or minus 2 gram permissible variation is maintained with the Compak volumetric feed. This means minimum product waste, assures uniform product and continued customer satisfaction.

Let Hayssen help you with your automatic packaging problems. Write or call your nearest Hayssen office today!

THIS IS OUR 50th YEAR AT

HAYSSEN

MANUFACTURING CO. • DEPT. PE-114 • SHEBOYGAN, WIS.

Offices in principal cities. Check your phone directory.

Atlanta • Boston • Chicago • Dallas • Denver • Detroit • Jackson, Miss. • Kansas City • Los Angeles
Minneapolis • New York • Philadelphia • St. Louis • San Francisco • Montreal • Toronto • Vancouver

totaled $26,752,000, up from $11,807,000 in the comparable 1958 period—a gain of 127 per cent. Sales for 1959's first nine months amounted to $529,782,000, a gain of 21 per cent over $438,361,000 for the same 1958 period . . . For the nine months ended September 30, 1959, **Hercules Powder Co.** reports net sales of $210,288,998, compared with $177,410,049 for the corresponding 1958 period.

American Viscose Corp.'s sales for the first nine months of 1959 totalled $185,281,000, compared with $154,663,000 for the same 1958 period. Net earnings for the same 1959 period were $11,170,000, as compared with $2,878,000 for 1958's first nine months . . . For the first nine months of 1959, **St. Regis Paper Co.** reports net income of $19,772,667 and sales of $317,848,125, as compared with 1958 income of $13,195,053 and sales of $371,107,768, for the same nine months . . . For the 12-month period ended September 30, 1959, **Spencer Chemical Co.** reports net earnings of $5,783,450, compared with $3,922,732 a year earlier. Sales were $59,888,411, up from $46,390,218 a year earlier.

Celanese Corp. of America reports earnings of $15,815,499 for the nine months ended September 30, a 57 per cent gain over the $10,082,719 reported for the same nine months last year. Sales for the 1959 period totaled $193,357,991, exceeding by 18 per cent the $163,573,099 sales for the comparable 1958 period.

What people are doing:

Robert E. Glass has been promoted to director of packaging of Publicker Distillers Products, Inc . . . Crocker, Burbank Papers Inc. has appointed **Malcolm J. Odell** as product development manager . . . **Joel Birkenmeyer** has been appointed to Milprint, Inc.'s sales staff.

Director of engineering for Crown Cork & Seal Co., Inc. is now **Roscoe H. Bowers** . . . Also at Crown Cork, **William I. (Bill) Lang** has been named general manager of the newly-formed dairy division . . . **William B. McNulty** is now Midwest polypropylene film sales representative for AviSun Corp. . . . Metal Edge Industries has appointed **Eugene C. Kain** as packaging engineer.

Manager of Celanese Plastics Co.'s Newark plant is **Paul C. Pearson, Jr.** . . . Changes in Hedwin Corp.'s sales operations are—**Austin M. Taliaferro,** industrial products sales representative for Middle Atlantic area and **E. Burley Edwards** New York resident sales manager . . . Mosinee Paper Mills Co. has appointed **Robert T. Seith** sales manager . . . **John H. Adams** is now special representative for supermarket sales of cellophane, American Viscose Corp.

Fenton J. Dowling is now manager

For more information circle No. 205 on Reader Service Card, Page 83

Your appliances, fragile instruments or other easily marred or damaged products "float" safely in Tekmold Protective Packaging . . . cushioned in the custom-formulated, custom-molded forms.

But that is only half of the wonderful story.

There is an excellent chance you can save up to 40 percent on your internal packaging costs.

At right are three typical experiences, reported by two of the largest radio manufacturers in the country.

MANUFACTURER X . . .

Previously used 3 pieces of corrugated and wrap	15.3¢ per unit
Switched to Tekmold end caps and wrap	12.6¢ per unit
Package saving	**2.7¢ per unit**
Additional labor saving with Tekmold	3.0¢ per unit
Total saving	**5.7¢ per unit**

MANUFACTURER Y . . .

Previously used 4 pieces of corrugated and cabinet wrap	14.175¢ per unit
Switched to Tekmold end caps without wrap	10.6¢ per unit
Package saving*	**3.575¢ per unit**

MANUFACTURER Y . . .

Previously used 2 corrugated inserts and cabinet wrap	20.0¢ per unit
Switched to Tekmold end caps and wrap	10.6¢ per unit
Package saving*	**9.4¢ per unit**

*There were also labor savings, not detailed in the report.

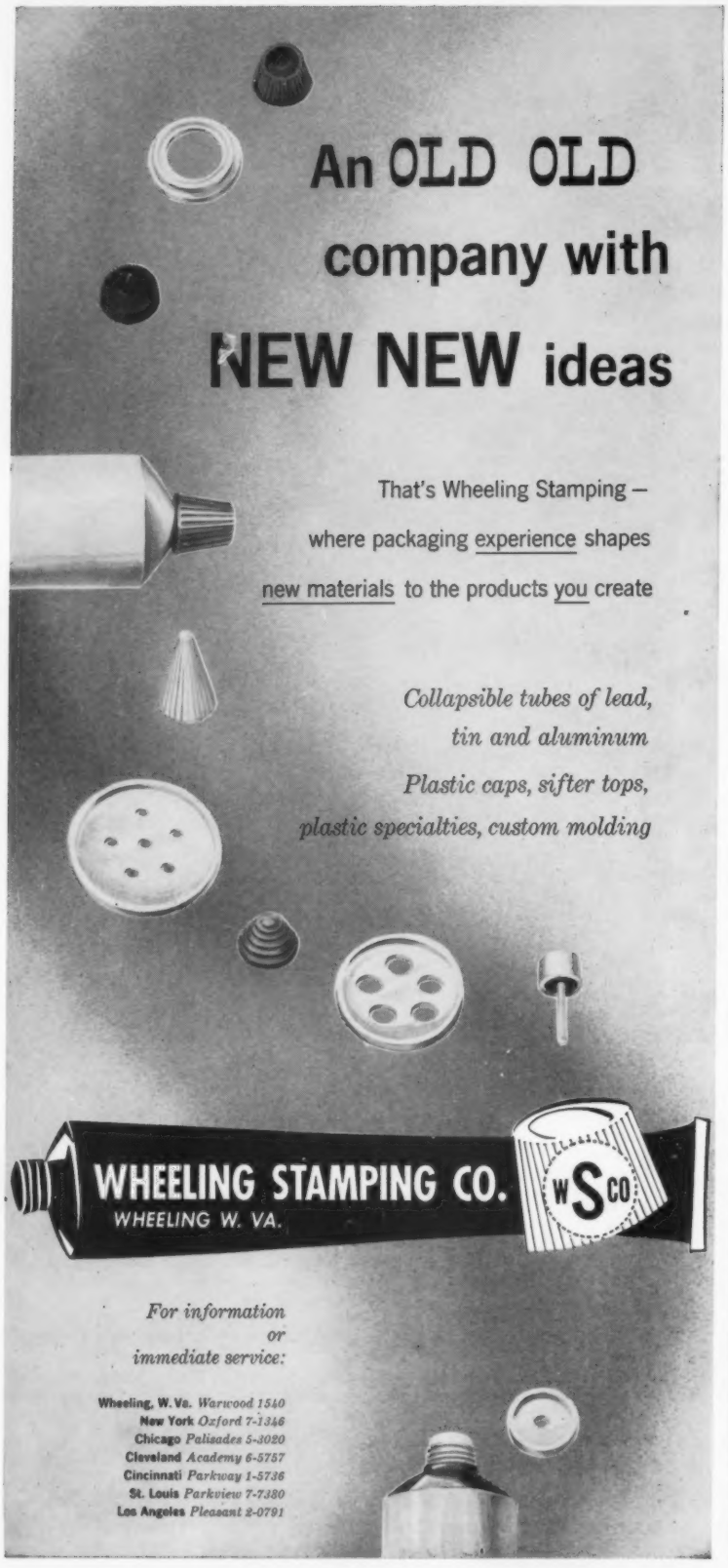
Let's end this message with a verbatim quote from the packaging foreman of a large appliance manufacturing company that switched to Tekmold Protective Packaging:

"*Boy, I hope I never see a corrugated fold-up again!*"

For the *complete* Tekmold story, write or phone us today.

TEKMOLD PRODUCTS PLANT
Bemis Bro. Bag Co.
325 27th Ave., N. E., Minneapolis 18, Minn.

BEMIS



of the marketing division, sales department of American Can Co.'s Canco Div. . . . Fibreboard Paper Products Corp. has appointed **George A. Hynes** to the newly-created position of manager, product merchandising.

Two newly-created positions within the marketing department of Amoco Chemicals Corp. have been filled by **R. E. Elliott,** manager-industrial chemicals services and **W. A. Hubbard,** manager-industrial chemicals sales . . . At Packaging Corp. of America, **D. W. Boylan** has been appointed controller, and **William G. Schopf,** director of public relations and advertising.

Thomas C. Gibson has been named assistant manager of the market development and customer service section of Du Pont's film department . . . At Crown Zellerbach Corp.'s Western Waxide Div. **Warren Thomas** has been promoted to production manager of the Los Angeles plant, **Russell E. Lawton, Jr.** has been named industrial engineer, San Leandro, and **James J. Hickey** has been promoted to assistant resident manager of the San Leandro plant.

Hinde & Dauch Div., West Virginia Pulp and Paper Co., has appointed two plant production managers: **W. Dana Chapin,** Gloucester, N. J. plant and **Alexander M. Santorella,** Hoboken plant. . . . **Samuel F. Schillaci** is now vice president, marketing for Plax Corp. . . . Brewster Enterprises, Inc. has elected **Walter H. Vander Weel** vice president and general manager.

Dobeckmun Co. has promoted **W. J. Bader** to sales manager of the packaging division, and **W. H. Troph,** sales manager, laminated and extruded products . . . **Joseph M. Schmied** has been appointed senior design engineer, packaging group of Fibreboard Paper Products Corp. . . . Aero-Chem Fillers, Inc. announces the re-election of **Charles O. Rader** as president.

New vice president of Testing Machines, Inc. is **George W. Menkes** . . . California and Hawaiian Sugar Refining Corp. has named **William G. Watt** manager of purchasing and packaging . . . **Edward A. Taub** has been appointed vice president in charge of corrugated manufacturing for Interstate Container Corp.'s corrugated plants.

Richard E. Jansing, Jr. has ben promoted to general sales manager of Hudson Sharp Machine Co. . . . National Starch and Chemical Corp. has appointed **Leonard J. Wood** as product manager of the paper division.

Five appointments in Continental Can Co.'s paper container division are: **S. R. Panter,** Eastern sales manager; **W. J. Simons,** Central sales manager; **R. J. Norman,** manager of sales and price administration; **T. P. McGlynn,** manager of market and new product development; **M. W. Ashby,** manager of plas-

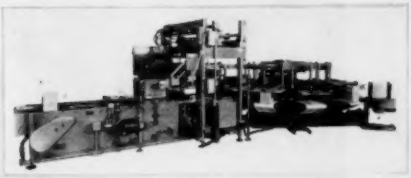
 For more information circle No. 207 on Reader Service Card, Page 83

Circle No. 208 on Card, Page 83

What?

Feed all these different sized cases, in random order, into one automatic case sealing installation?

Yes! It's being done. The Omnimatic-Rotopress automatically seals and discharges corrugated shipping containers of widely varying dimensions, fed to it in random order, at speeds up to 20 cases per minute. A choice of pre-set discharge patterns permits the simultaneous use of as many as five different Rotopress discharge stations, with sealed cases of different heights automatically discharged to separate take-away conveyors. Employing a unique circular compression unit, the entire installation occupies only 144.9 square feet, and permits random feeding of cases that may vary in length from 8″ to 30″ in width from 6″ to 22″ and in height from 6″ to 18″.



Packomatic Omnimatic-Rotopress operating at the General Electric Company's Trumbull Lamp Plant at Warren, Ohio.

WRITE for 8 page technical brochure giving complete design, application and dimension data. Request Packomatic Brochure 100-60.

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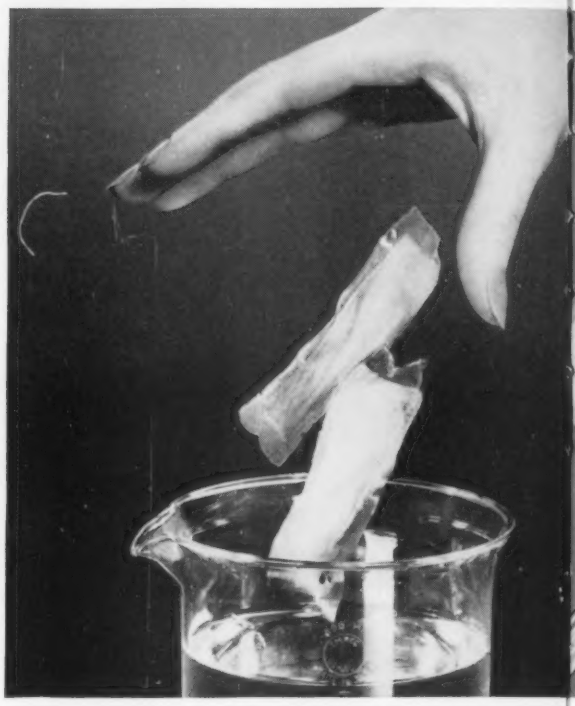
for product packaging or for product fabricating

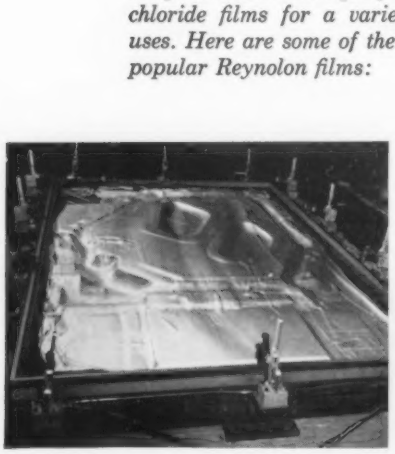
REYNOLON® PLASTIC FILMS

improve quality, cut costs, speed production

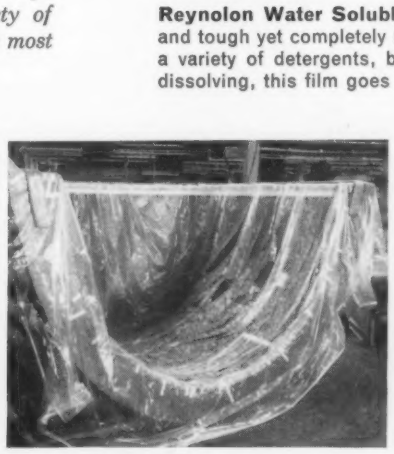
Leading companies in diversified industries use Reynolon polyvinyl alcohol and polyvinyl chloride films for a variety of uses. Here are some of the most popular Reynolon films:



Reynolon Water Soluble PVA/WS-1 film is heat sealable and tough yet completely soluble in water—ideal for packaging a variety of detergents, bleaches, insecticides and dyes. On dissolving, this film goes into complete solution.



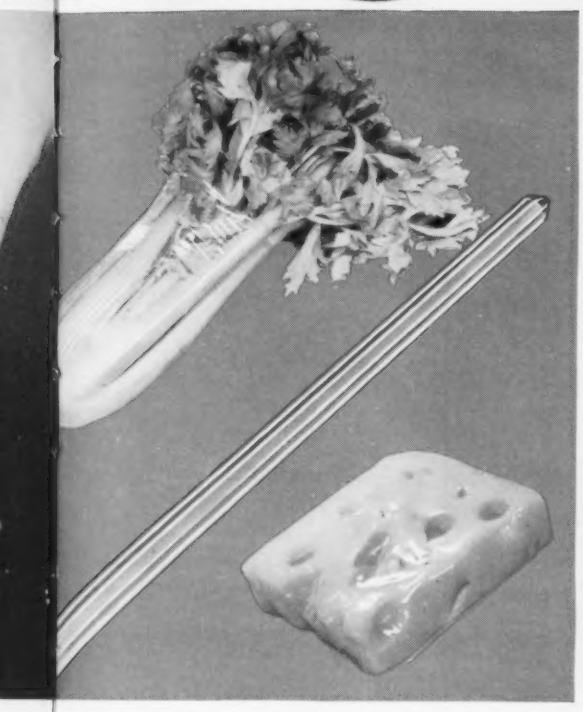
Reynolon MBA/4-3 series is a "super-pli" film that improves adhesive metal bonding. Takes temperatures to 500° F and pressures required to insure satisfactory bonds.



Reynolon PVA/4-6 series is designed for bag molding. It speeds production—is far less costly than matched metal dies. Ideal for molding reinforced plastic parts.

Reynolon Matte-Finish PVA/4-2 a new polyvinyl alcohol film designe for use in furniture, cabinet and wa panel fabrication and other applications

YNOLON



Reynolon Shrinkable Oriented PVC 500 Series is a new film ideal for packaging of meats, vegetables, fruits and a variety of products such as window shades, stationery supplies, paper products and many others. This film is crystal clear, shrinkable to form a skin tight package. It has high tensile strength, offers low temperature flexibility, has extremely good shelf life. Printable and sealable by heat, by solvents or by adhesives. It can be metalized. Easily laminated to paper, chipboard and other materials.

Reynolon Cast Vinyl PVC/200 Series films are available for skin packaging . . . for use as glass substitutes . . . for fabrication of protective cover products, inflatables, oxygen tents and many other applications. These films are super clear, pliable and have a lustrous sparkle—actually beautify as they protect. They are durable—stay attractive. These films are also chemically inert, have low moisture vapor and gas transmission rates, are heat or electronically sealable, printable, odorless and non-toxic.

For details and technical assistance on Reynolon films, contact the Reynolon Plastic Specialist in the Reynolds office in New York, Camden, Detroit, Chicago, St. Louis or Los Angeles. Or write direct to *Plastics Division, Reynolds Metals Company, P.O. Box 2346-RP, Richmond 18, Virginia.*

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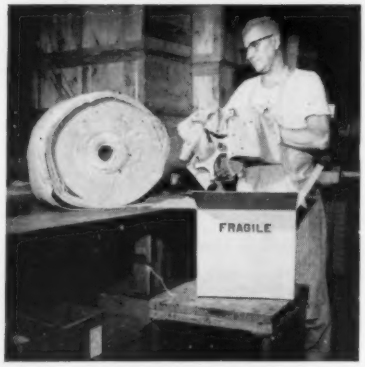

A cleaner, faster operation resulted as International Equipment Co., Boston, switched from excelsior (left) to Cel-Fibe wadding (right) to wrap motors, parts, test tubes, and dynamically balanced instruments in its line of precision centrifuges for laboratory uses.

CEL-FIBE® protective packaging doubles output, increases safety

"Cel-Fibe cellulose wadding is the best packaging material we have ever used," says C. Clifford Hodge, production coordinator for International Equipment, leading supplier of laboratory centrifuges, citing these improvements:

Savings in time, labor. An operator packs double the amount—Cel-Fibe wrapping takes only half as long.

Savings in materials. With Cel-Fibe, one carton holds as much as was formerly packed in two cartons or a wooden case. Cel-Fibe ends the need for separators to partition tubes, fragile parts, and glassware.

Savings on storage. Wadding, paper, and other packaging materials are kept with space to spare in a room that had previously been set aside for storing a ton of excelsior.

Savings in shipping weight. Cel-Fibe permits use of fewer, lighter cartons.

Savings in maintenance. Apart from easier handling, non-shredding and non-powdering Cel-Fibe leaves no dust in the air or dirt on the floor, reduces clean-up time . . . also makes it easier, faster, and less messy for customers to unwrap orders.

Savings on returns. Low-sulfur and neutral-pH Cel-Fibe guards metals from corroding and surfaces from marring, avoids return of centrifuges bent or unbalanced in transit.

Your packaging problems can probably be lessened by learning how "success is certain with Cel-Fibe" in meeting military specifications and civilian requirements for cushioning and surface protection. Cel-Fibe is always available, when and as you need it. For more information—*write, wire, or phone:*

CEL-FIBE

Division of Personal Products Corp.

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ONE OF THE Johnson & Johnson COMPANIES

tic bottle sales . . . Chief engineer for H. G. Weber & Co., Inc. is **W. E. (Jack) Karr** . . . **Carl F. Allen** has been named sales and service engineer of the South Central region by Kartridg Pak Co.

Campco Div. of Chicago Molded Products Corp. has named **Bernard Trachtman** sales representative . . . **Gerald R. Grant** is Chicago district manager, container division, Container Corp. of America . . . Rap-In-Wax has promoted **Harold W. Wendorf** to vice president of engineering and development for all corporate activities . . . **Peter R. Hayes** has been assigned to design research activities with Aluminum Co. of America's closure division.

General Foods Corp. has elected **Charles G. Mortimer** chairman of the board and **Wayne C. Marks** president of the corporation . . . **Ronald G. Thoresen** has joined the sales department of the Gardner Div. of Diamond National Corp. . . . Pitney-Bowes, Inc. has promoted **Joseph A. Lamplugh** to the new post of administrative assistant to the vice president for sales and service . . . West Virginia Pulp and Paper Co.'s new kraft division sales (a consolidation of the kraft paper and containerboard sales groups) will be headed by **Robert S. Kettrick.** West Virginia's multiwall bag division has created a Middle Atlantic sales district to be headed by **H. Lockwood Frizzell.**

Minnesota Mining & Manufacturing Co. has appointed **Joseph C. Duke** to the new position of executive vice president for sales administration and public relations . . . Three new district sales managers for the packaging group of Fibreboard Paper Products Corp. are—**C. F. Jean Arrasmith,** Fresno; **A. W. (Bill) Brown, Jr.,** Portland; **James D. Terrell,** Oakland . . . **Charles E. Fogg** has been named manager of Du Pont Co.'s new plant for manufacture of "Mylar."

Appointments at Hinde & Dauch's Torrance, Calif. plant are, **Roy E. Jury,** district sales manager and **Fredrick J. Bauer,** district production manager . . . Amoco Chemicals Corp. has named **Fred H. Moulton** district sales manager . . . **Kenneth D. May** has been named sales representative for Crown Zellerbach Corp.'s Western Waxide Div.'s new Boston office.

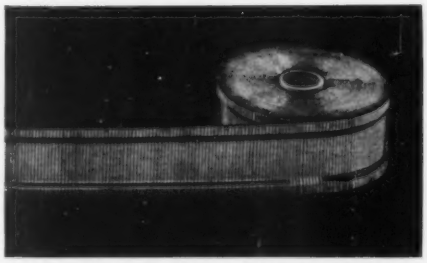
At Owens-Illinois Glass Co., **Edward A. Coleman** has been appointed Eastern manager—closure sales, closure and plastics division, and **Edwin D. Dodd** vice president of Owens-Illinois Glass Co. and general manager of its paper products division . . . Coated Products, Inc.'s new sales division in New York will be managed by **William B. Zener** . . . New sales managers at Chippewa Plastics Co. are **Thomas E. Fritscher** and **W. O. Van Doren. William H. West** has joined Chippewa's technical sales staff. *(End)*

We call this the Bostitch GOLDEN BELT

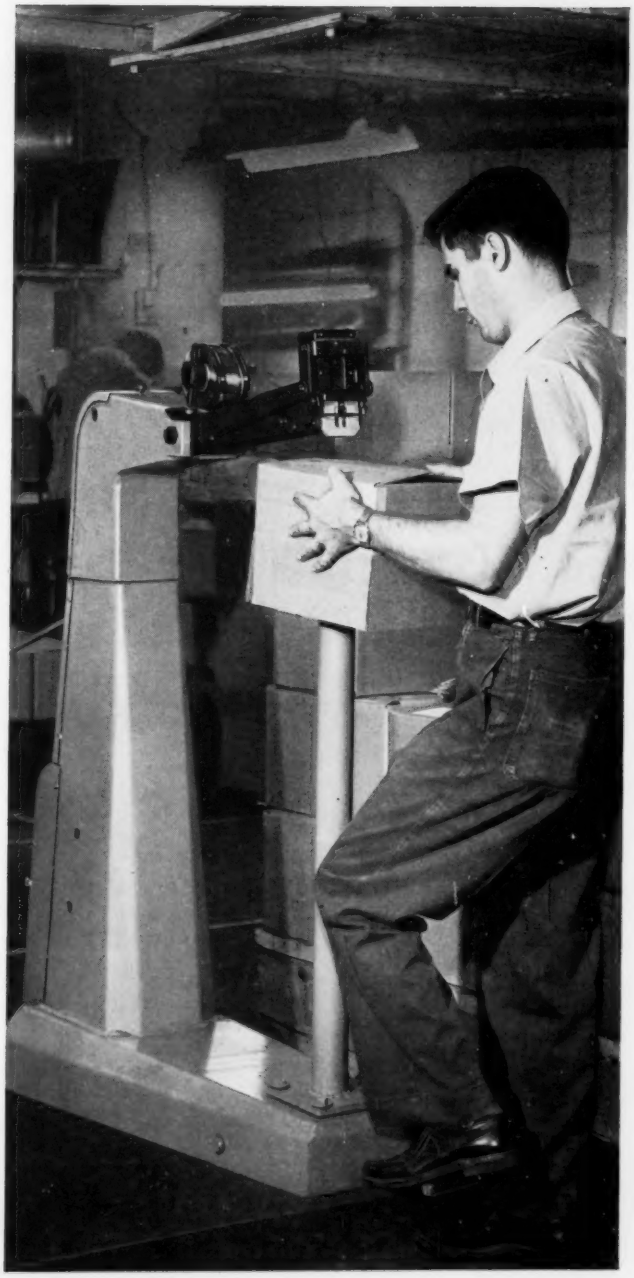
You'll call it the fastest, lowest-cost box bottoming stapler you've ever seen!

The Bostitch Golden Belt Box Bottomer is a revolutionary new concept. The belt on top consists of 4000 cohered and partially formed copper-finished, wide-crown staples. This permits bottoming 1000 boxes without reloading. Four wide-crown staples completely bottom a container which would require 12 to 16 staples of smaller size. You can staple the entire length of the seam in one straight pass through the machine without reversing the box, thus cutting stapling time in half.

Your Bostitch Economy Man—one of 350 who work out of 123 U.S. and Canadian cities—has cost and speed facts on the kind of cartons you bottom. Call him—or drop a line to Bostitch, 372 Briggs Drive, East Greenwich, Rhode Island.



Golden Belt staples have 1¼" crown width, leg lengths of ½", ⅝" or ¾", and meet maximum spacing requirements of Rule 41.



Fasten it better and faster with

BOSTITCH®
STAPLERS AND STAPLES

TWENTY-TON LOAD aboard trailer fails to bother multiwall sack made with CLUPAK kraft. Patented, built-in stretch absorbs shock as wheels pass completely over. Sack contains 100 pounds of abrasive sand-blasting grit, found difficult to package prior to use of CLUPAK paper multiwalls.

NAIL SHAKE-UP test shows how CLUPAK paper resists puncture. After two minutes, ordinary bag resembles porcupine, but only two nails have penetrated tough, flexible CLUPAK paper.

MAIL GOES THROUGH without complaints when the wrapper is CLUPAK kraft. Leading magazines find tough, flexible CLUPAK paper survives rough handling far better than ordinary kraft wrap.

NEW PAPER WITH REVOLUTIONARY *"TOUGHNESS"* MAKES PAPER VIRTUALLY A NEW MATERIAL

ABSORBS SHOCKS INSTEAD OF TEARING! CLUPAK Extensible Paper opens a new era in paper . . . its applications are unlimited. For CLUPAK paper has a built-in *stretch* or extensibility which lets it absorb the shocks and strains that cause ordinary paper to rip, tear and puncture. The result is a new dimension in paper—*toughness*. And the greater *flexibility* of CLUPAK paper is important where folding, bending, wrapping or filling is involved. Already CLUPAK paper is giving multiwall sacks, grocery bags, asphalt and decorative laminates, protective bags, polyethylene coated papers and many other products better performance, often at lower cost.

KEY FACTS FOR BUYERS: CLUPAK kraft is the same as ordinary kraft except that it is stronger, tougher and more flexible. It can be made in many basis weights, and with varying degrees of stretch. Printability, surface friction, porosity and other properties can be controlled as with ordinary paper. Clupak, Inc., does not make paper. It carries on continuous research and development work, and results are made available to all licensees, listed below. **Clupak, Inc., permits use of its trademark only on paper which meets this company's rigid toughness requirements.** Clupak, Inc., 530 Fifth Avenue, New York 36, N. Y.

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Dynas Aktiebolag (Sweden)
Hudson Pulp and Paper Corp.
International Paper Co.
St. Lawrence Corp., Ltd. (Canada)
St. Regis Paper Co.
Union Bag-Camp Paper Corp.
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Label casualties
prevented with a Tickometer

Use basic labels, with blank spaces for mandatory data or specifications. Use a Tickometer—to imprint ingredients, size, color, weight, price or code number on labels as you need them—for the day, lot, pack or special order. When label changes are necessary, change your Tickometer imprint quickly and easily. Avoid the waste of unusable pre-printed labels, cut label inventories and printing costs.

- A Tickometer imprints accurately, with good register, from 400 to 1,000 pieces per minute — labels, wrappers, small cartons. Handles most weights and finishes of paper and light board; in sizes from 1 by 2 to 15 by 15 inches.
- Tickometers can be used for marking, stamping, endorsing, dating, cancelling—tags, tickets, sales slips, coupons, forms, checks, at a very considerable saving of time and work.
- The Tickometer also counts up to 1,000 pieces a minute. *It's so accurate that banks even use it to count currency.* Can be set for a predetermined count. And can be equipped for consecutive numbering. Feeds and stacks automatically, is easy to set and operate, can be used by anybody. It may be rented or bought. And Pitney-Bowes service is always close at hand, from 304 points.
- Call the nearest Pitney-Bowes office for a demonstration. Or send coupon for free illustrated booklet and case studies.

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Film for bread wrappers extruded from Tenite Polyethylene by Pollock Paper Company; general offices, Dallas, Texas. Plants and sales offices located coast to coast.

Bread now goes to market the modern way...wrapped in film of **TENITE** POLYETHYLENE

Pollock Paper Company, *division of St. Regis Paper Co., using medium-density Tenite Polyethylene, supplies bread wrappers offering many advantages to both bakers and housewives*

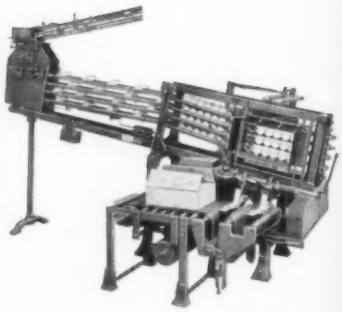
When bread is wrapped in film of Tenite Polyethylene, housewives are getting maximum freshness protection...grocers, a package with super sales appeal...and bakers, two-way economy: reduced wrapping costs, with fewer stale returns.

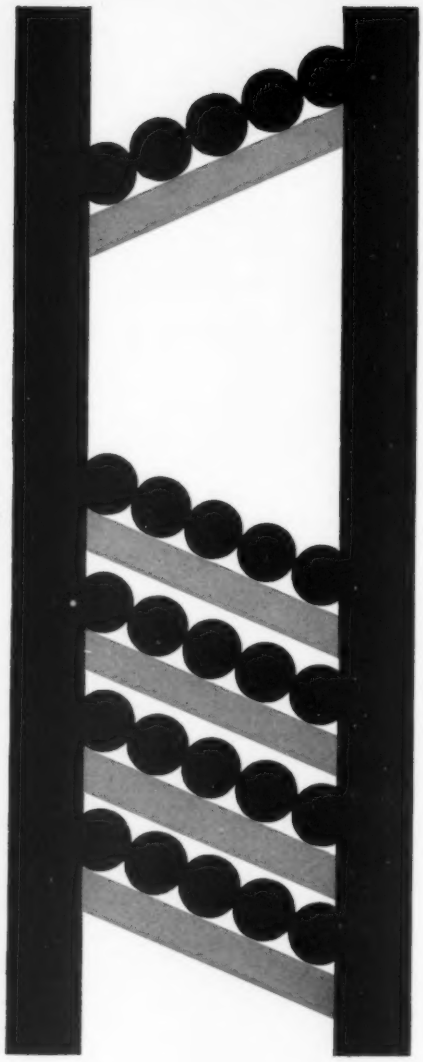
Film extruded from medium-density Tenite Polyethylene offers an ideal combination of properties: resistance to moisture transmission prolongs freshness; sparkling finish and outstanding clarity add sales appeal; softness of feel emphasizes the bread's freshness. This film also possesses just the right stiffness and slip for efficient use on high-speed packaging machines. Its wide heat tolerance means efficient operations on wrapping machines, and minimizes waste. And, in use, film of Tenite Polyethylene retains its strength even at low temperatures. From wrapping room to kitchen it offers maximum resistance to impact and tearing.

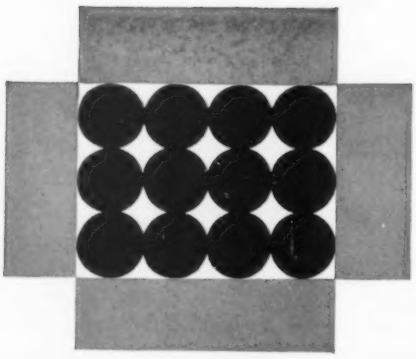
For all these reasons, Pollock Paper Company, the nation's leading supplier of bread wrappers, has selected Tenite Polyethylene as its standard of quality. Extruded on special equipment to assure utmost clarity and sparkle, Pollock's "POLY-SEAL" film is used by bakers from coast to coast.

For more information about this film... for guidance in adapting existing wrapping equipment and developing suitable wrapping techniques... write Pollock, or EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

TENITE®
POLYETHYLENE
an Eastman plastic







DOWNHILL TO HIGHER EFFICIENCY

Standard-Knapp Type F Packers use to full advantage the basic physical fact that cans—like wheels—gather speed going downhill. That's why case loading on "F" packers is naturally fast, naturally efficient. Range of the Type F encompasses all standard case patterns, with single or double tiering. Cans roll to the packer and are loaded into cases on their chines. Labels are protected and remain untouched until the cans are removed from the cases. Like to get more information on "F" packers? Write us for the names of users near you or for engineering specifications.

Emhart Manufacturing Company
Portland, Connecticut
Standard-Knapp Packaging Equipment

EMHART

Switch to packages that do <u>everything</u> for your product

SHINE...
SELL...
PROTECT

Alcoa Wrap aluminum foil packaging is your answer. It gleams brilliantly, attracts more pick-me-up sales . . . it seals airtight foil-to-foil, or combines with laminants to assure double and triple product protection.

No wonder so many fine products now carry this label—

BETTER PACKAGING
ALCOA WRAP
ALUMINUM COMPANY OF AMERICA

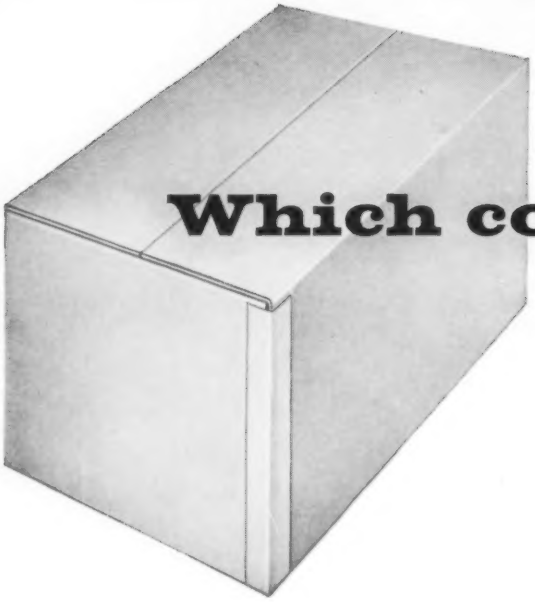
Exactly what does this label mean?

It means—Alcoa, with the greatest fund of aluminum knowledge in the world . . . Alcoa, with the only full-scale packaging laboratory in the country, where we can test ideas, check costs, answer all problems from design to package performance . . . Alcoa teamed with their converter specialists to provide so much more than any single company can—top facilities, top service, top know-how, all along the line.

Does your packaging need improving?

Whatever your plans or problems, we're all set to tackle them. For complete information call your Alcoa salesman, or write: Aluminum Company of America, 1657-M Alcoa Building, Pittsburgh 19, Pennsylvania.

What you should know about "manufacturer's joints" in Union Boxes.



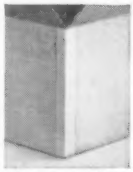
Which corner of a box

One corner is more important than the rest: where your corrugated shipping container is held together. This "hinge", or manufacturer's joint, often holds the key to your box's performance.

As the illustrations show, manufacturer's joints comprise three basic types: taped, stitched, and glued-lap. Each does a special job. Knowing which to use, and when, calls for a detailed analysis of your product and how it will be shipped.

Union Box engineers will be glad to make such a study for you. This is part of Union's complete structural design service. These fundamentals, however, are excellent guides:

Many shippers prefer tape



Taped Joint (outside)

Tape is generally gum-backed, reinforced kraft paper or cloth, having high tear strength, especially in the lengthwise direction. Tapes are 2, 2½ and 3 inches wide and come in varying grades depending on degree of strength required.

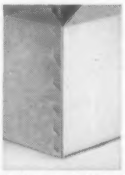
should you examine first?

Advantages: no projections. In stacking, boxes lie flat, rock less. Also, entire interior area of box can be used. The taped joint is continuous, too . . . seals out dust and dirt. And it folds to make a true box corner.

On the other hand, tape is frequently more expensive than other manufacturer's joints. It can be adversely affected by moisture also. In some cases, tape may interfere with printing.

The sturdy stitch

Frequently used for heavy items like canned goods, this joint uses steel staples driven from the outside of the box panel. It is probably the strongest "hinge", gives the most positive closure, and is not affected by moisture or cold. It is usually the least expensive.



Stitched Joint
(outside)

The closure, however, is not continuous. And, since the metal stitches may protrude inside the box, this joint is normally not recommended for fragile and prone-to-scratch articles.

The diagonal stitched joint shown is a typical arrangement. Others include vertical, horizontal, and double stitching.

Glued lap . . . the versatile joint

Flap may be adhered either to the inside or outside of the box, and to the end or side panel. Inside-flap gluing is the most popular. It is the only joint which leaves a completely uninterrupted exterior printing surface.

Like the taped joint, the glued lap joint is continuous . . . forms a true fold. Performance under adverse moisture conditions is questionable. Also, inside-lap does not give 100% clear inside-packing area.

Glued Lap Joint
(inside)

Take full advantage of Union's accumulated knowledge in constructing and recommending manufacturer's joints for shippers in every industry. Consistently well-engineered features such as these offer the surest protection for your product and your shipping investment.

Write for Union's free, informative booklet "Manufacturing Corrugated Boxes."

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Southern Division—P.O. Box 570, Savannah, Ga.; P.O. Box 454, Lakeland, Fla.
Western Division—4545 W. Palmer, Chicago, Ill.

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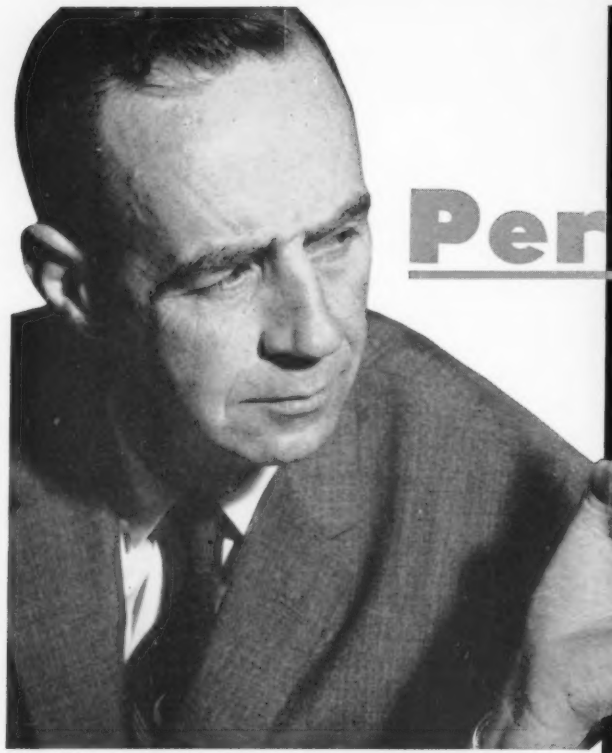

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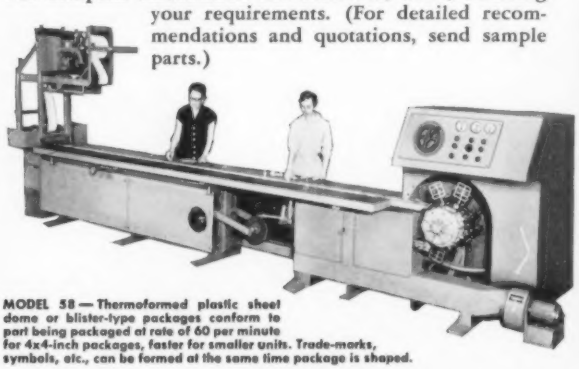
PACKMASTER

The All Around Answer to Hard Goods Packaging

Automatic protective packaging, printing, and counting of an almost endless list of products is provided by Sundstrand-Packmaster machines. Packages are formed in a complete range of sizes and shapes using thermoformed plastic, heat-sealing papers, cohesive paper, foils, films, laminates — in fact, just about every known type of packaging material.

For complete information and literature, write, outlining your requirements. (For detailed recommendations and quotations, send sample parts.)



MODEL 58 — Thermoformed plastic sheet dome or blister-type packages conform to part being packaged at rate of 60 per minute for 4x4-inch packages, faster for smaller units. Trade-marks, symbols, etc., can be formed at the same time package is shaped.

▲ MODEL 50 — Feeds out packages up to 6x6 inches in die-cut ribbon for accordion folding or individual separation. Speeds to 80 per minute on 3x3-inch packages.

MODEL 56 — Any length workpieces from ¼" to 2" thick and up to 24" wide. Typical parts handled include automotive grills, extrusions, telephone bases, etc.

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SUNDSTRAND PACKAGING EQUIPMENT

SUNDSTRAND-AMERICAN BROACH

Division of SUNDSTRAND CORPORATION • Ann Arbor, Michigan

Manufacturers and distributors of Packmaster Machines

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These good-looking shipping containers are made from Sunkraft linerboard—one of 24 special linerboards made by International Paper.

Amazing new Hydro-Chem by International Paper withstands rain, cold storage, manhandling

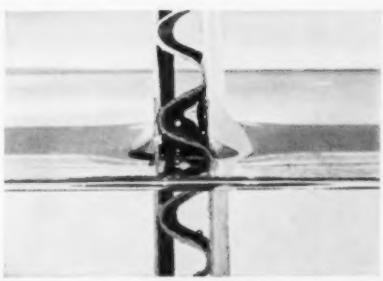
HERE, at last, is a corrugating medium that weathers grueling shipping problems that could make a soggy mass out of any ordinary container. And for surprisingly low cost!

It's International Paper's amazing new Hydro-Chem. Boxmakers now hail it as perhaps the greatest advance in corrugating materials in over a decade. Here's why:

Hydro-Chem's remarkable *wet strength* can withstand prolonged periods of high humidity, cold storage, severe weather—*even total submersion!* Hydro-Chem is ideal for shipping meat, fruit, vegetables, flowers—and for freezer storage.

New Hydro-Chem gives "long haul" performance—and, unlike coated, sized or impregnated corrugated media, has superior bonding and runability qualities.

If your shipping containers need built-in *wet strength*, it will pay you to see your boxmaker about new Hydro-Chem today.



New Hydro-Chem retains full strength even when dunked repeatedly in water.

Southern Kraft Board Division **INTERNATIONAL PAPER** New York 17, N. Y.

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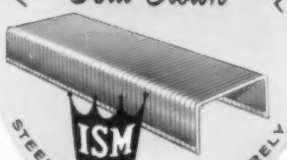

STEEL STAPLES SEAL SECURELY

International Staplers

INTERNATIONAL STAPLE & MACHINE COMPANY
P. O. BOX 270 • HERRIN, ILLINOIS

Originators of Carton Closing Staplers

"Liners made of

Monsanto Polyethylene 706 help us guarantee year-'round availability of whey products"

Western Condensing Company, Appleton, Wisconsin

Under the trade name, "Peebles Whey Products," Western Condensing Company manufactures a major portion of this country's production of whey products.

The nature of these products demands that they be packaged in tough, inert, and moisture-proof containers. High standards of sanitation must be maintained. Those products used for human consumption must be prevented from taking on foreign odors or flavors.

Some containers are too costly—and their bulk creates a pre-loading storage problem. Others deteriorate through weathering or handling accidents, or don't provide moisture resistance to prevent caking during prolonged storage or extreme temperature conditions.

Through the use of polyethylene liners inside multi-ply paper bags, Western has become the first company to guarantee a year around supply of whey products.

Guarantee dependable packaging service bag after bag, liner after liner. Order polyethylene packaging film based on "Tough 706," the Monsanto resin specifically developed for industrial packaging. For names of converters or suppliers, write to Monsanto Chemical Company, Plastics Division, Rm. 1007, Springfield 2, Mass.

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A galaxy of well-equipped Gaylord researchers constantly scans the packaging world, searching out answers to container problems that seem light-years away today.

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INTRODUCING A NEW MODEL IN THE PROVEN LINE OF SURE-WAY PACKAGE CASERS

Automatically opens cases—loads—seals

smooth
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—up to 25
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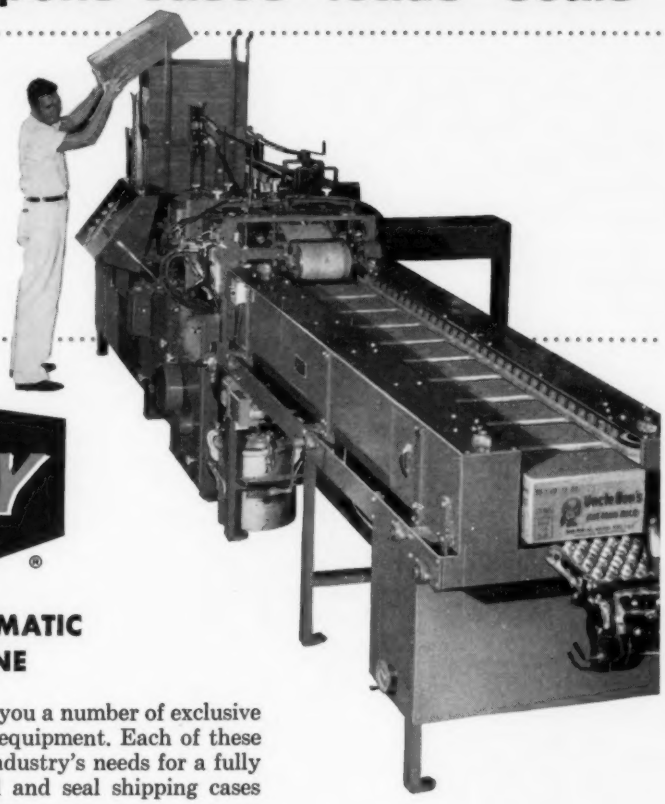

SURE-WAY®

MODEL 50 FULLY AUTOMATIC INTEGRATED CASING LINE

The Model 50 "Sure-Way" brings you a number of exclusive features in fully automatic package casing equipment. Each of these features is carefully designed to meet the industry's needs for a fully *automatic* machine to erect, position, load and seal shipping cases in a continuous high-speed, in-line operation.

Shut downs and bottlenecks are eliminated. Operating costs are reduced. To sum it all up, here is the machine that helps build profits. Here are a few of the major features:

The new shipping case feeding and erecting mechanism employs duplex vacuum cups which are cam activated, stripping the bottom case from the vertical stack of 125 or more flat shipping cases.

New pressurized gluing system, incorporating "No case-No glue" device, gives greater uniformity of glue application, cuts maintenance and cleanup time. Intermittent motion of the compression unit allows maximum dwell time in minimum floor space – the average unit is less than 29′ long, overall.

Complete console station centralizes all control of the machine, ensuring a smooth uninterrupted operation, Safety interlock switches throughout provide sure, positive functioning. Write for full information or call your nearest FMC representative.

The automatic case erecting-positioning assembly and the sealing-compressing assembly are available separately for existing installations of "Sure-Way" Casers.

"Sure-Way" Model 50 integrated casing lines are operating in several leading plants. Shown here is one of two complete lines at the Houston plant of Uncle Ben's, Inc. Others already installed, or scheduled for early delivery, will be handling a wide variety of packaged products such as aluminum foil, cake mixes, sugar, soap and detergents. There is virtually no limit to the range of packages, patterns, case sizes and casing combinations the "Sure-Way" can handle.

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Dehydrated Adhesive

Minute Maid Corp. of Orlando, Florida, uses dehydrated Aqua-Flakes® for high speed case sealing. Frozen juice is about 15° below zero. Cases are quickly put in sub-zero storage. A real test of adhesive power!

REDUCES CASE SEALING COSTS

Aqua-Flakes are high quality liquid glue that has been dehydrated. They give lowest possible cost wherever volume is large. Only the water has been removed. Only the water has to be replaced. Simply by mixing the flakes into water.

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Aqua-Flakes film smoothly. Tack fast. Give excellent coverage. They are used in combining, laminating, heading and wrapping, tube winding, etc. Contact your nearest National office for information.

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DOW Plastiatrics

DOW'S CLINICAL APPROACH TO HEALTHY PLASTICS APPLICATION

in packaging

NEW TYPE OF COTTAGE CHEESE CONTAINER DEVELOPED FOR REGULAR PRODUCTION

Fig. 1

For many years, colorful plastic containers made of Styron® have accounted for the increased sales of hundreds of diversified products. Until now, however, cottage cheese has been most successful in this modern package for special promotions and premium packaging.

Recently, one of the nation's leading dairies asked Dow to help develop a plastic container that could compete with conventional containers and be used in regular production rather than as a premium with cottage cheese. Cost would have to be reduced without sacrificing the selling advantages of the container.

NEW METHOD CUTS COSTS

It was decided, therefore, to develop and refine containers formed from high impact polystyrene sheet, in order to reduce weight and cost. A thorough study of the variables followed.

Available equipment and fabrication rates were studied. Designs were investigated for their aesthetic appeal and for their adaptability to automatic dispensing, filling and capping equipment. Material distribution was studied within the parts. Container weights were tested to determine minimum weight without breakage. Product shelf life in plastic was tested and found excellent. Legal requirements, shipping rates and volumetric requirements were also studied.

FORMED CONTAINERS MEET ALL REQUIREMENTS

New, lightweight containers (Fig. 1) formed of polystyrene sheet met every requirement and offer some noteworthy features . . .

Formed plastic lids proved most efficient. (Metal lids are hard to remove and can cause stress cracking of the plastic. Paper lid dimensions change with absorption of moisture.)

The stacking boss insures proper distance between stacked containers, and eliminates jamming (see diagram in Fig. 2).

The split-mold technique was used for the molds. The base section incorporates the design and can be cast at relatively low cost. An accurately machined upper section combines with the cast section to give accurate dimension for fitting containers and lids. And exact volumes are easily obtained by shaving off the top of the base section of the mold before it is attached to the upper section.

This new type of container is typical of the packaging ideas that can develop when you work with Dow. If you wish to discuss a plastics packaging application with the Dow Packaging Committee contact your nearest Dow Sales Office or THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 2175DH12.

TYPICAL STACKING BOSS DESIGN

(H is stacking boss)

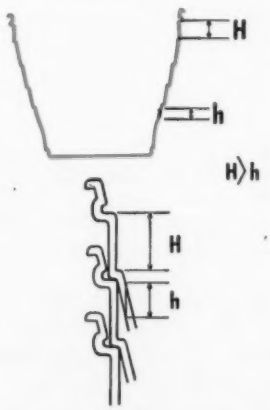

Fig. 2

AMERICA'S FIRST FAMILY OF THERMOPLASTICS

Styron*
Ethocel*
Tyril*
Saran
PVC Resins
Zerlon*
Polyethylene
Pelaspan*

*Trademark

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

These boxes do everything but balk...

H & D corrugated boxes for shipping Sohio wax start through this machine knocked down. They're set up, packed and sealed—automatically. Would precision packaging speed up your operations? Better see H & D.

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AUTHORITY ON CORRUGATED PACKAGING • SANDUSKY, OHIO
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How POLYETHYLENE AFFECTS WAX COATINGS for paperboard

By Robert Rosenbaum,
Supervisor of Technical Service,
Semet-Solvay Petrochemical Division,
Allied Chemical Corporation,
Tonawanda, New York

- ***Blocking point***
- ***Hardness***
- ***Softening point***
- ***Scuff resistance***
- ***Gloss***
- ***Gloss retention***
- ***WVTR***
- ***Chemical resistance***
- ***Tensile strength***
- ***Flexibility***
- ***Adhesion***
- ***Coating weight***
- ***Coating distribution***
- ***Gluing***

By adding low molecular weight polyethylene to paraffin and microcrystalline waxes for paperboard coatings, it is possible to tailor the performance properties of a package to attain effects not possible with wax coatings alone. This is typical of polyethylenes generally which differ widely in molecular weights, molecular weight distributions, viscosities, densities, and other properties. **A particular characteristic of low molecular weight polyethylene is its low melt viscosity.** (See Table I.)

This makes it of special interest for use with wax coatings on paperboard because it blends readily with waxes and the resulting coatings can be run on conventional waxing equipment. A typical example: An extrusion grade polyethylene would have a molecular weight over 20,000 and a several million centipoise viscosity, and a few per cent would raise the viscosity of a wax blend above the limits of a waxer.

A significant trend in packaging today is the precision combining of specific factors or properties of performance, cost, and appearance in packaging a given product. Seeking to avoid both overdesign and underdesign, packaging development experts strive to plan their packaging with as much quantitative precision as possible.

Seek Right Combination

Thus, every package has *a particular required combination* of such properties as scuff resistance, blocking, water vapor transmission rate, hardness, chemical resistance, flexibility and gloss—to name just a few. Relating these general requirements to the use of low molecular weight polyethylene for board coatings, we might look at just what the addition of polyethylene does to the wax in these coatings.

For example, suppose we want to package an appliance in a corrugated box. We may want abrasion resistance to be about twice as good as paraffin and we want no blocking at 120°F. A study of available curves on these two properties would indicate the need of 5 per cent polyethylene to meet the blocking requirements, but a need for some 30 per cent polyethylene to meet the abrasion specifications.

A good starting point for the coating might be to have about 30 per cent polyethylene in the paraffin. Depending on the waxes you use and the particular test methods you follow, the results may vary somewhat. However, we feel the trends and general effects will be about the same. (*Turn page*)

Widely used as flexible packaging and for bottles and containers, polyethylene is also finding application as a coating for paperboard—for example, a folding carton or corrugated box coated with a wax-polyethylene blend. In reviewing low-molecular weight polyethylene for board coatings, Mr. Rosenbaum looks at its effect on the functional properties of waxes as measured and interpreted by various standard tests. He also relates the application and function of these coatings to some specific packaging uses.

Properties To Examine

Blocking point. Focusing on the effect of polyethylene on the functional properties of waxes, we might look first at the blocking point. This is a measure of the sticking, marring of the surface, and loss of gloss which occurs when coated paper on board is subjected to heat. Looking at TAPPI Test T-652 sm-57, we see that blocking point is defined as the lowest temperature at which coated paper will stick together sufficiently to injure the surface. Since blocking generally occurs over a range of temperature rather than at specific point, the test measures both a pick point and a 50 per cent blocking point.

The pick point is the lowest temperature at which any film disruption occurs. The 50 per cent blocking point is the temperature where half of the surface is marred.

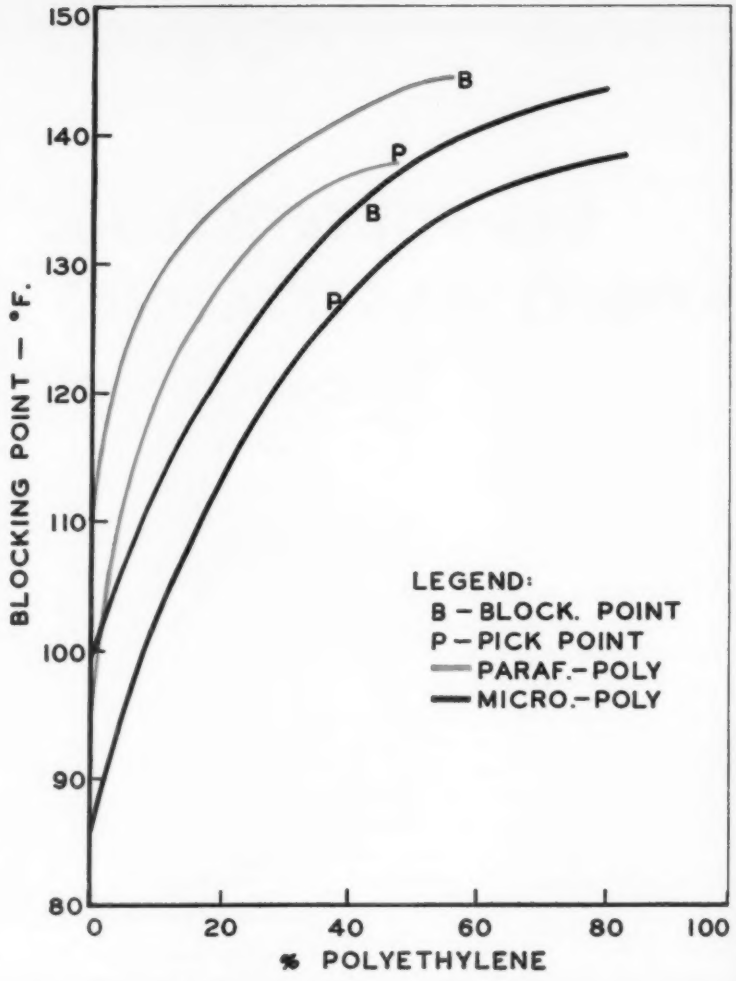
Doing The Test

In making this test, you fold coated paper strips with the coated surfaces together and place them on a blocking plate. This plate (36x12x2 in.) is heated at one end and cooled at the other in order to create a known temperature gradient all along its length. Your test strips remain on this plate under a load of 1 lb./sq. in. for 17 hr. This conditions them. Next, you remove your specimens, unfold and examine them, and as prescribed by the test, determine your blocking temperature.

A typical result is that the polyethylene raises the blocking point of petroleum waxes. (See Fig. 1.) This increase in the blocking point is due to the polyethylene raising the softening temperature, increasing the hardness of the coating and preventing oil and low molecular weight fraction in the waxes from bleeding to the surface. Our experience has been that, as a rule, 5 per cent polyethylene is sufficient to eliminate danger of blocking during summer weather around the country.

TABLE I
Typical Properties Of Low-Molecular Weight Polyethylene

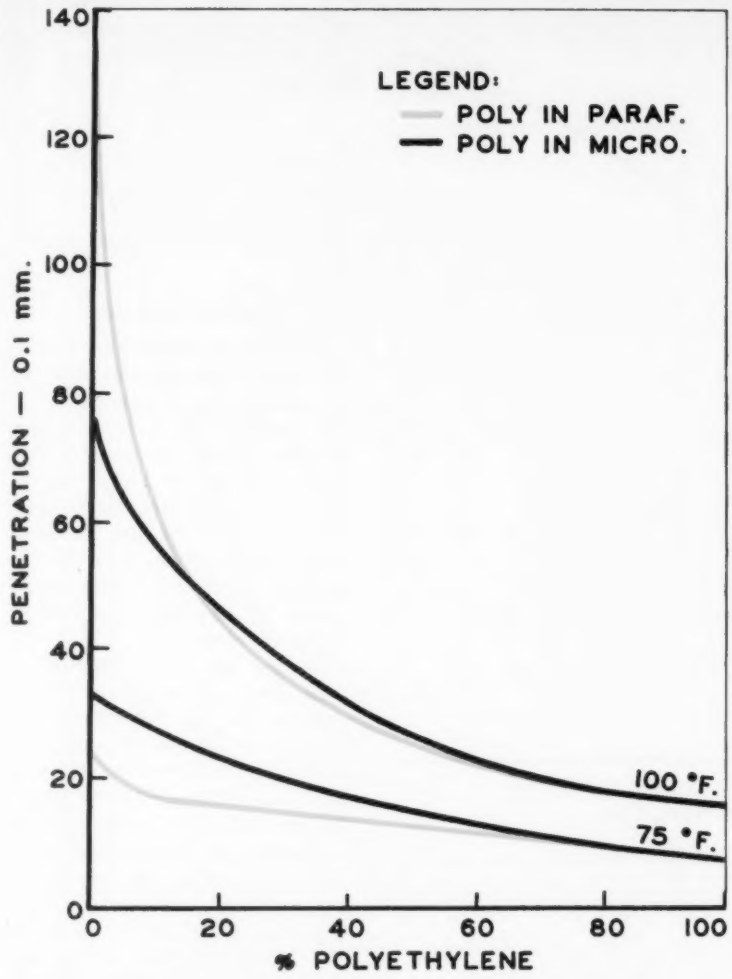
Molecular weight	2,000
Softening point	225°F.
Congealing point	215°F.
Specific gravity at 75°F.	0.92
at 250°F.	0.77
Needle penetration — 0.1 mm.	3-5
Viscosity at 250°F.	200 cps.
at 300°F.	130 cps.
Color	White



1 BLOCKING POINTS OF POLYETHYLENE-PARAFFIN AND -MICROCRYSTALLINE BLENDS are higher than of waxes alone. Polyethylene raises blocking point since it increases softening temperature, coating hardness, and prevents oil and low-molecular weight fraction in waxes from bleeding to surface. Usually 5 per cent polyethylene eliminates blocking danger in summer.

Hardness. This is another functional property affected by the addition of polyethylene. We normally measure hardness by the needle penetration test (ASTM-D 1321-51 T). Penetration of a standard needle into the sample when applied for 5 sec. under a 100 gm. load determines hardness. Although it is common practice to run this test at room temperature, we think it is often more meaningful to obtain figures in the 100°-120°F. range. A coating is more likely to soften, stick, and fail at such elevated temperatures as these than at room temperatures. For example, coatings with identical hardness at 75°F. may differ greatly at 100°F.

We find that polyethylene increases the wax hardness at room temperature and is exceptionally effective in warm temperatures as shown by the 100°F. curve. (See Fig. 2.) Even though there are some exceptions, the hardness of the coatings ties in with abrasion re-



2 NEEDLE PENETRATION—POLYETHYLENE IN PARAFFIN AND IN MICROCRYSTALLINE WAXES —measures blend hardness. Polyethylene increases wax hardness at 75°F.; also effective at 100°F. With exceptions, coating hardness ties in with abrasion resistence, gloss retention under handling, blocking temperature. (Test run with needle applied for 5 sec. under 200-gm. load.)

sistance, gloss retention under handling, and blocking temperature. Methods suggested above constitute a good screening test as it is run on the wax blend itself. In contrast, many tests require a sample of coated paper on board.

Softening point. You will find that the softening point of the wax-polyethylene blend does not take place at a definite temperature. As the temperature rises, these materials gradually change from being hard and brittle to becoming softer and less viscous liquids. For this reason, you must make this determination by a fixed and closely defined method. We suggest the ball and shouldered ring method (ASTM-E 28-51T). **The softening point is defined as the temperature at which a disk of the sample held within a horizontal ring is forced out under the weight of a steel ball when the sample is heated at a prescribed rate.**

You pour the molten blend into brass shouldered rings which are $^{25}/_{32}$ in. inner diameter at the shoulder and $^{5}/_{8}$ in. inner diameter for the remainder. The height is $^{11}/_{64}$ in. for the shoulder and $^{5}/_{64}$ in. for the remainder.

After cooling for 30 min., you cut off the excess wax cleanly with a knife. Then, you center a steel ball $^{3}/_{8}$ in. in diameter and weighing 3.5 gm. on the sample cut. You put the ring in a holder and lower the assembly into a water or glycerine bath. This is heated so that the temperature increases at the rate of 5°C. a min. **The softening point is the temperature at which the steel ball drops through the sample.**

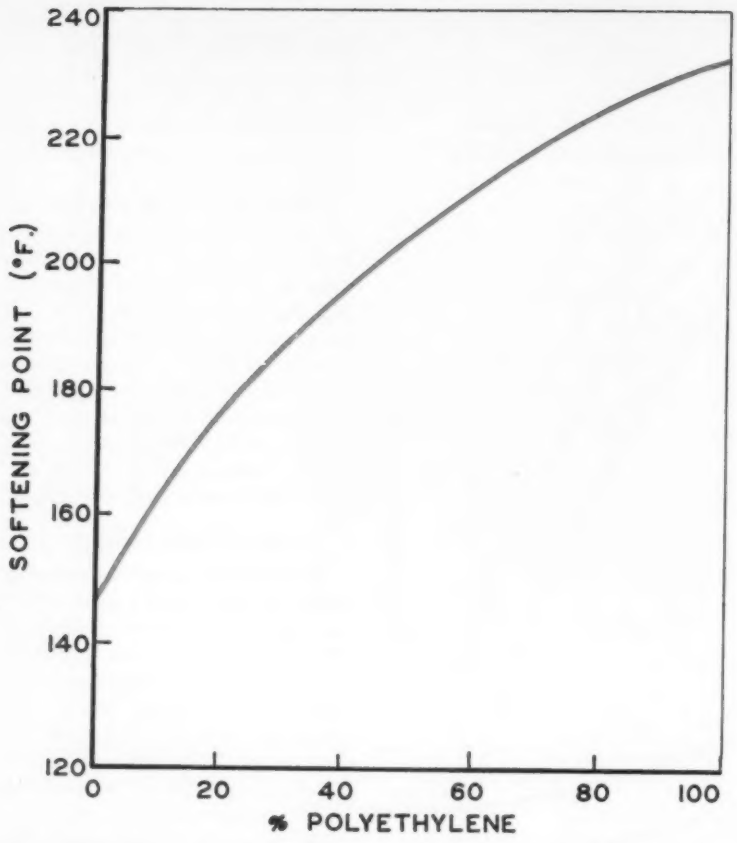
Polyethylene Behavior

Polyethylene raises the softening point of wax. (See Fig. 3.) This test also gives you some indication of the behavior of the coating at warm temperatures. Some materials which are packaged warm will melt wax coatings; however, if you use a waxed polyethylene blend on the container for such products, you may find that you can satisfactorily package them due to the higher melting point of your coating.

Scuff resistance. Here is a property that is frequently important for corrugated boxes. The usual reason for adding polyethylene to such a box coating has been to improve abrasion resistance. At present, unfortunately, we can cite no standard method of measuring this property of coated paper. You will find many methods in use.

A typical example of such measurement is the Taber Abraser. This has two abrasive wheels which ride on the test sample which, in turn, is rotating in a horizontal plane. There is a vacuum cleaner that

Robert Rosenbaum was graduated from the College of the City of New York with a bachelor degree in chemical engineering. After doing research work at Pollock Paper Co., he joined Semet-Solvay in 1953 and is now supervisor of technical service in research and development. Mr. Rosenbaum is a member of American Chemical Society, Technical Association of the Pulp and Paper Industry and the TAPPI-ASTM joint technical committee on petroleum wax.



3 **SOFTENING POINT OF PARAFFIN WAX** rises with addition of polyethylene. Test gives some indication of coating behavior at warm temperatures. Some products packaged warm melt wax coatings; polyethylene-wax-blend coating may prevent this due to its higher melting point.

removes the abraded particles to reduce clogging of the wheels. **The weight of coating abraded in a specified number of cycles is a measure of the abrasion resistance.** Soft, tacky coatings tend to clog the wheel and give false results.

We note that polyethylene improves the abrasion resistance of paraffin. (See Fig. 4.) We ran our test at 75°F. You will find the improvement with polyethylene is even more pronounced at higher temperatures.

Other instruments may give different results because they measure other types of abrasion including scratching, gouging, and wear under different loads. But regardless of what method you use, we feel that you will find polyethylene improves your scuff resistance.

Gloss and gloss retention. When you examine these properties of gloss and gloss retention, you will find that initial gloss is a function not only of the coating formulation, but also of the coating technique. **In general, the addition of polyethylene increases the gloss of wax coatings.** You can get high gloss with some paraffin coatings, but you also may lose your gloss on its exposure to warm temperatures or rough handling. A few per cent polyethylene in wax will give you coatings that should show no loss of gloss after 24 hr. at 120°F.

Generally speaking, you attain maximum gloss by rapid cooling rates and a smooth coating surface. The conventional method of achieving high gloss is the water quenching of the molten coating. Recent developments in coating procedures, however, permit the coating to solidify against a mirror finished casting roll.

Water vapor transmission rate. When you make tests involving a wax-polyethylene blend, you will find that the WVTR of the blend is poorer than paraffin when tested flat at 100°F. and 95 per cent relative humidity. However, field packaging tests frequently show the blends to be superior because of better scuff resistance and flexibility.

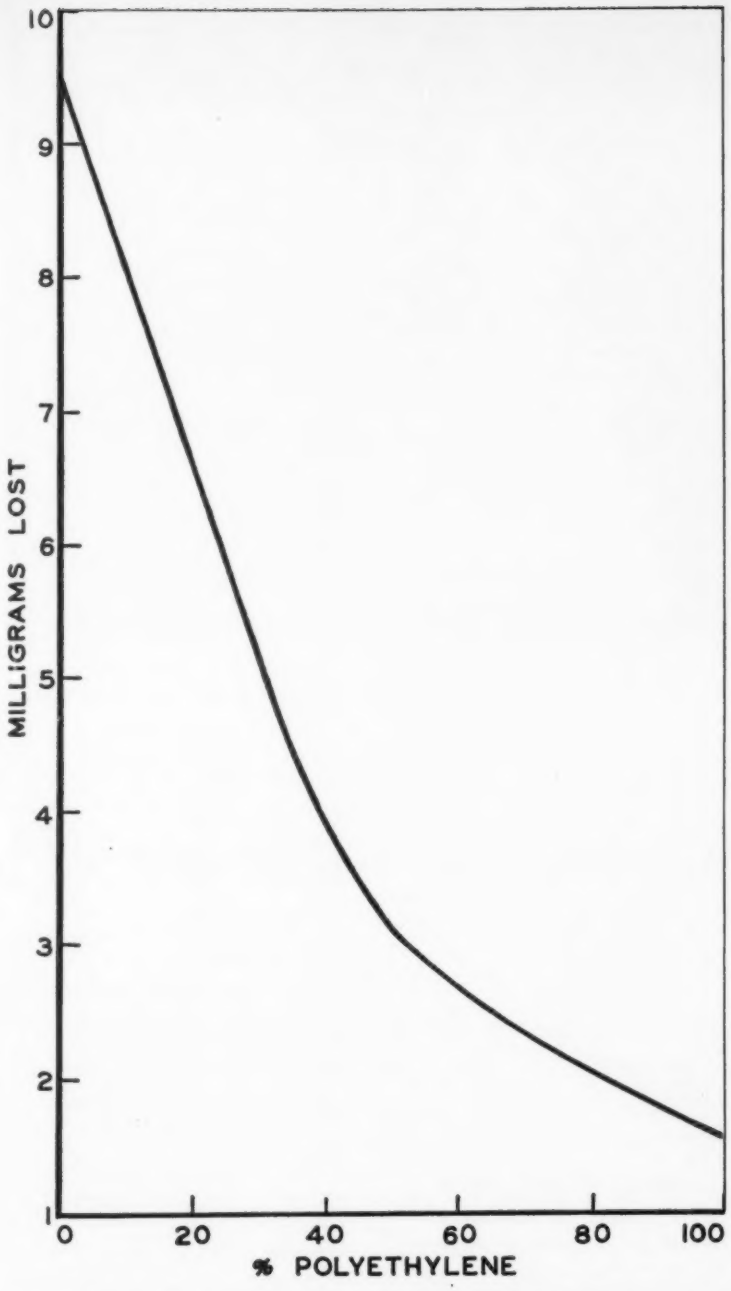
Why Lab Tests Excel

We must remember that laboratory water vapor transmission tests are usually run on relatively perfect samples which are carefully handled during the tests. Thus, their results are the best obtainable with a particular coating. Field results fall short of the predicted values by varying amounts—depending on how the package responds to handling, temperature changes, and aging.

In one test, the water vapor transmission rate was 0.3 gm./24 hr./100 sq. in. for paraffin. In contrast, when using 5 per cent polyethylene in this paraffin, the water vapor transmission rate was 1.0 gm./24 hr./100 sq. in. In spite of the superiority of paraffin coating in transmission rate, we found that baked goods packaged in these wrappers lost equal weights. We also found that with severe handling, the polyethylene blend proved superior.

Chemical resistance. Polyethylenes are often chosen for their chemical resistance, and we frequently add them to waxes to improve the chemical resistance of coatings. **Obviously, you will get no appreciable resistance unless your coating is free from pinholes.** We have seen failures attributed to lack of resistance in the coating, but closer examination indicated that the difficulties were due to pinholes in the coating.

Any slight change in the material packaged may result in the failure of a previously successful coating. For example, a bakery changed its pan oil from straight mineral oil to one containing 7 per cent cottonseed oil. Although the oil remaining on the baked goods



4 **TABER ABRASION TEST ON POLYETHYLENE-IN-PARAFFIN WAX BLEND** shows polyethylene improves scuff resistance. Results are from test run at 75°F.; improvement with polyethylene more pronounced at higher temperatures. (Test run using No. 10 wheel, at 50 cycles, with 250-gm. load.)

was but a small per cent, grease failure of the package occurred in two days. It was necessary to change the coating to obtain a desirable five days' resistance to grease.

Feel. This is a property affected by polyethylene. The addition of polyethylene to wax changes its feel from the characteristic "waxy" one to a plastic type of feel which shows good release properties. Some powdery or sticky materials which adhere to wax coatings release readily from coatings of wax-polyethylene blends.

Tensile strength and flexibility. Adding low molecular weight polyethylene increases the tensile strength and flexibility of paraffin wax. You reach a peak with about 20 per cent polymer. (See Fig. 5.) The exact maximum varies with paraffin, shape of molds, and rate of elongation. **We find that the use of polyethylene not only improves room temperature tensile strength, but also the tensile strength and flexibility at low temperature**—such as you might encounter in a refrigerator or freezer.

Tensile strength, flexibility, and adhesion to the board, determine the behavior of the coating to scoring, forming, and denting. If your coating is too brittle, you have cracking and flaking. This is usually more pronounced at low temperatures.

Coating weight and distribution. These experience changes when you add polyethylene. This is because of the higher viscosity and melting point. Polyethylene reduces penetration into the board and this often results in substantial reductions in wax consumption. The amount of surface wax is usually increased. You will find these changes more pronounced on porous stock.

Gluing. This is more difficult on a wax-polyethylene coating than on straight paraffin. The blends resist dewaxing by conventional methods because of higher viscosity and melting point. You may wish to use pressure-sensitive latex adhesives, but you will probably find your gluing rate too slow for most applications. Adhesive manufacturers are working on this problem and we predict that they will solve it in the near future, either by a latex or an epoxy adhesive. At present, most boxes are fastened by interlocking, tape or staples.

Functional Application

Reviewing various containers where these coatings find application, we might look first at milk containers. Typically, these receive coatings of waxes containing up to

TABLE II
Wax Consumption And Distribution On Milk Carton Coatings

Polyethylene (%)	Wax Pickup (%)*	Wax Distribution (%)	
		Surface	Internal
0.0	41.2	46.5	53.5
0.5	37.0	49.3	50.7
1.0	33.4	65.5	34.5
1.5	36.0	70.0	30.0

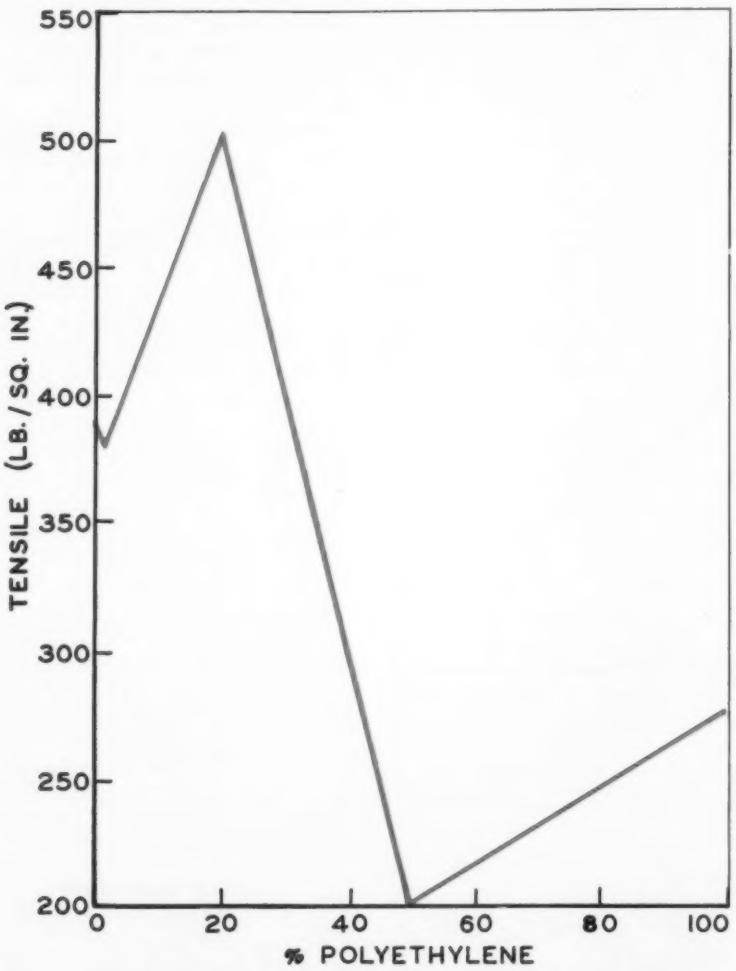
$$* \% \text{ Wax Pickup} = \frac{\text{Total coating wt.} - \text{Wt. of raw stock}}{\text{Wt. of raw stock}} \times 100$$

TABLE III
Coating Weight Of Corrugated Board Vs. Per Cent Polyethylene

Polyethylene In Paraffin (%)	Coating Weight (lb./1,000 sq. ft.)
0	7
5	7
10	6
20	5
40	4
60	3

2 per cent polyethylene. Current coating methods by which the formed carton is dipped in wax and then drained fix this limit. High viscosity coatings will not drain properly. Thus they give a rough surface and excessive coating weight.

You may find that premium dairy waxes give cartons a smoother and more even finish with a plastic-like feel. Table II shows the effect of polyethylene in reducing wax pickup and in changing wax distribution. We have found that polyethylene usually cuts wax consumption from 5 to 20 per cent. Polyethylene hardens the coating and reduces scuff-off on packaging machinery.



5 **TENSILE STRENGTH OF POLYETHYLENE-IN-PARAFFIN WAX BLEND** reaches peak with about 20 per cent polymer. Exact maximum varies with paraffin, mold shape, elongation rate. Polyethylene improves room temperature tensile strength; also tensile and flexibility at low temperature.

Coatings For Boxes

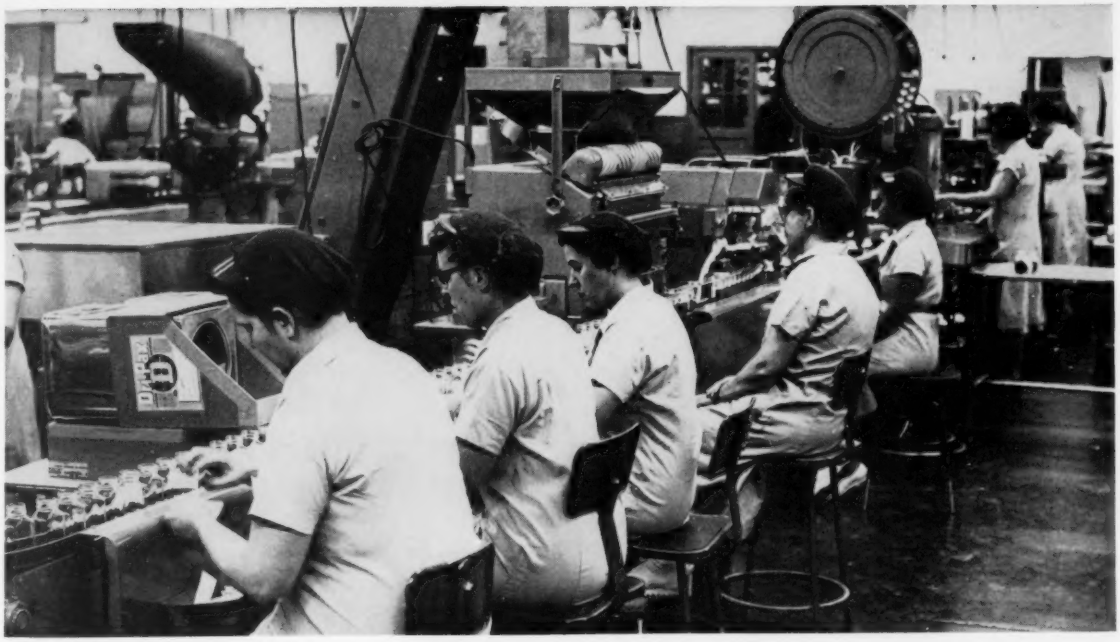
Corrugated boxes requiring coatings usually get blends containing from 10 to 90 per cent polyethylene with a typical figure being 20 per cent. Table III shows the results of a series of tests demonstrating how the higher setting point and increased viscosity reduce penetration in the board and frequently result in less wax consumption.

There is also a change in weight distribution. The paraffin coating may have only 10 per cent surface wax with the remainder being in the board. The blends have 30 to 80 per cent surface wax. This surface wax is necessary to eliminate fiber scratching.

Lack of fiber scratching and good scuff resistance are particularly important when packaging appliances and furniture—a major application of wax-polyethylene coated corrugated board. Release properties of this board permit packaging of tacky materials such as synthetic rubber. Where coatings have used high per cents polyethylene, grease resistance has been improved according to reports.

Butter and ice cream cartons often have coatings of blends containing up to 5 per cent polyethylene. **Use of the polyethylene is to impart improved gloss, higher blocking and better scuff resistance.**

High gloss cartons coated by casting against a mirror finished roll represent a recent development. The polyethylene helps to impart high gloss, good abrasion resistance, blocking, and a hard surface. (*End*)



FLEXIBILITY AND EFFICIENCY ON THIS "TABLET 100" PACKAGING LINE make it possible to run six different bottle sizes and three cap sizes.

Pharmaceutical packaging line is flexible

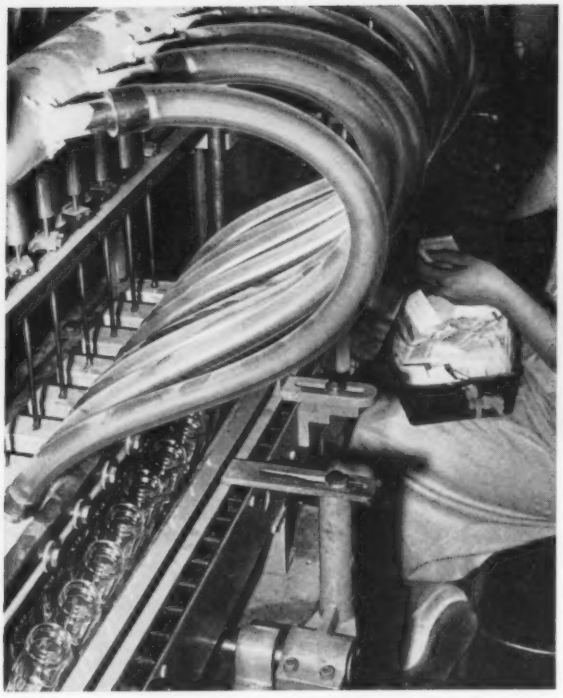
By Franklin Baker, *Industrial Engineer*
Industrial Engineering Department, Schering Corporation, Union, New Jersey

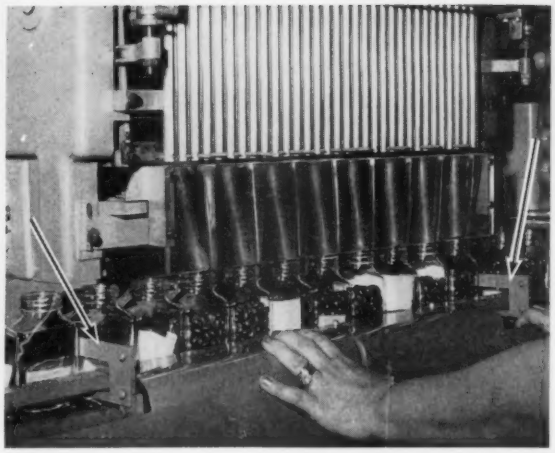
When planning our new "tablet hundred" packaging line for Coricidin and other products, we were looking for flexibility and efficiency rather than high speed. We needed a line that could run six different bottle sizes, each to hold 100 tablets. The shapes and sizes of the bottles, and the sizes of the tablets dictated the use of three cap sizes. Using standard packaging equipment mostly, and several methods of our own for transferring the bottles from one conveyor to another, we have an efficient packaging operation at a line speed of 60 bottles /min.

Bottles Feed To Cleaner

In operation, the cases of empty bottles are supplied to the first operator who unloads the bottles onto the feed table of a Machinery Service unscrambler and bottle cleaner. Rather than have the cases of empty bottles stacked on a pallet near this operator, the cases are fed to her from a roller conveyor which delivers them onto a ball conveyor adjacent to the multi-tier carton unloader. This eliminates the need for the girl to have to pick up the cases and place them on the unloader. The roller conveyor is supplied by a raw materials supply man.

Cleaned by filtered air and then evacuated, the bottles are discharged from the bottle cleaner eight abreast onto a continuous-motion chain conveyor. They are then transferred by a conventional circular transfer table to another chain conveyor which is a part of the Lakso tablet filler and cottoner unit. The length of travel between the unscrambler and filler is sufficient to allow space for three girls to insert small packets of silica gel (used in four products packaged on this line) into bottles. (*Turn page*)





FEEDING BOTTLES IN GROUPS OF EIGHT TO FILLER is smooth operation due to "stops" (arrows). Right one holds group under heads for filling, while left one holds back bottle column coming from unscrambler. A brake (not visible), ahead of left stop above, holds bottles back when left stop releases next group of eight to filling station.

CLEANED BY FILTERED AIR AND EVACUATED, bottles come from cleaner eight abreast, pass operator who places silica jel into each one.

Fills Eight Bottles At A Time

The bottles feed in groups of eight to the filler which has eight filling heads. To accomplish this operation smoothly, a "stop" holds the group under the straight row of filling heads. Another stop positioned before the filler, holds back the entire column of bottles leading from the unscrambler, while the group of eight is being filled.

Before this latter stop, there is still another stop or "brake" which holds back the bottles when the second stop releases the next group of eight bottles to the filling station.

Conveyor Is Part Of Filler

The need for this system of stopping the bottles for filling arises from the fact that the chain conveyor on which they ride is of a continuous-motion type. This conveyor is of sufficient length to carry the bottles from the silica gel station through the Filma-Seal glue applicator section and is timed with the filler. When released by the stop after filling, the bottles resume their travel to the cottoning equipment and then to the glue applicator which applies an adhesive for the Filma-Seal over the top of the bottle.

Our inspection station is located between the cottoner and the glue applicator. This consists of a large mirror on the opposite side of the conveyor from the operator, to aid her in checking the front and back sides of the bottle for broken tablets, proper cottoning, and to be certain that a packet of silica gel has been inserted when required.

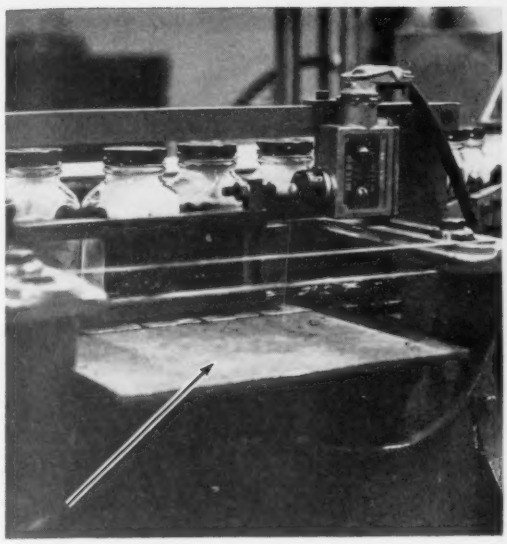
Our Resina capper, adjustable for different size caps and bottles, is the next piece of equipment in the line. Instead of a chuck-type head, it has two rows of "heads," each consisting of three large rubber discs, aligned parallel to one another, with one row on either side of the path of travel of the bottles. Rotating at reasonably fast speed and all in the same direction, these discs tighten the caps as the bottles pass between them. The discs are adjusted so that their edge surfaces just contact the edge surface of the caps.

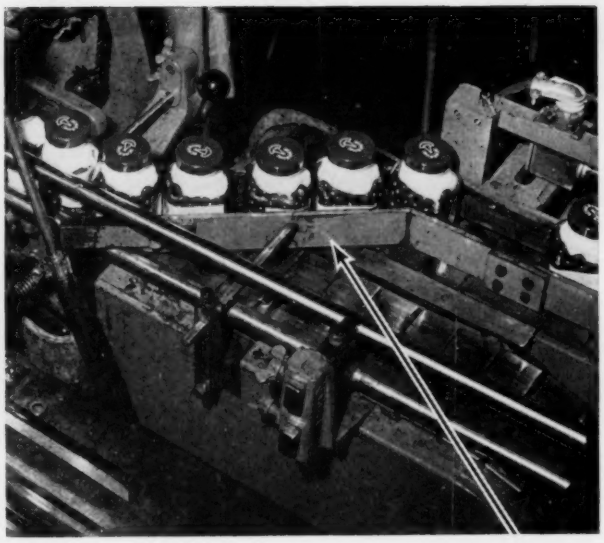
Conveyors Overlap—Use Transfer Guides

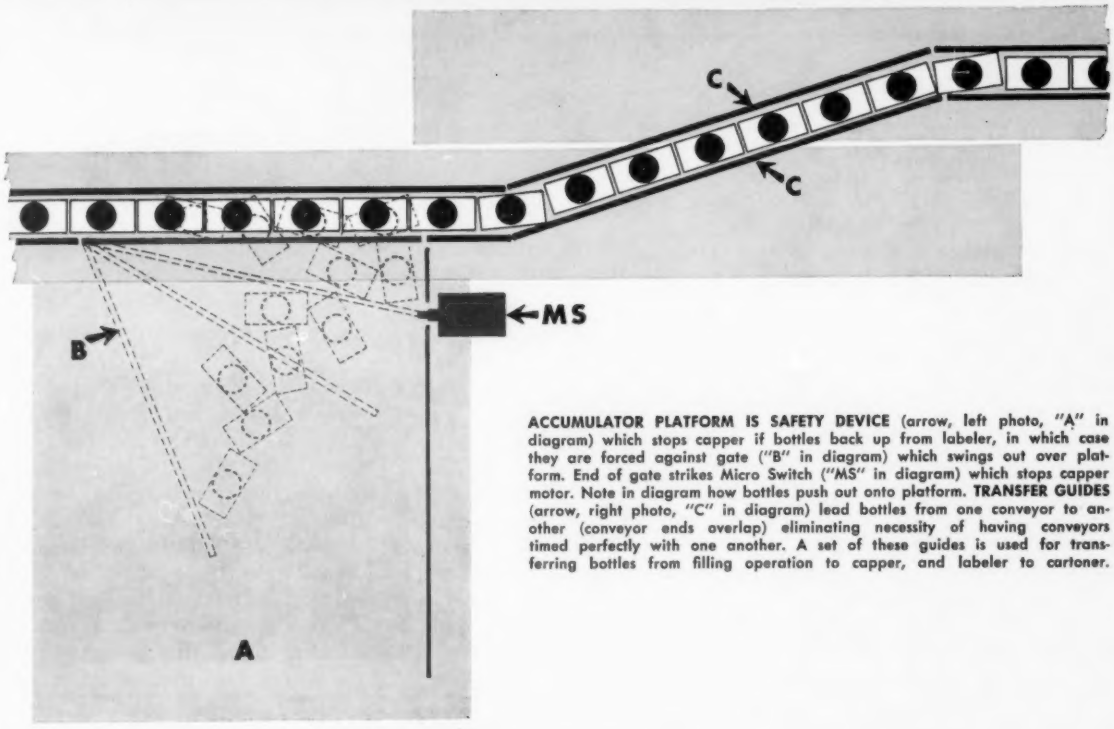
The capping unit contains its own chain conveyor which is run by the master drive on the capper. To eliminate the necessity for having this conveyor timed perfectly with the one which carries the bottles through the filling operation, we installed the equipment so that the ends of the two conveyors overlap in a horizontal plane approximately 10 to 12 in.

As a means of transferring the

High speed may not always be the answer to an efficient packaging line, as is the case for some pharmaceutical products. Flexibility on Schering's new "tablet 100" line bears out this fact. Pointing out that his company needed a line to run six different bottle sizes using three different cap sizes, Mr. Baker describes how standard packaging equipment is coordinated, and the use of several company-built methods of bottle transfer and handling.







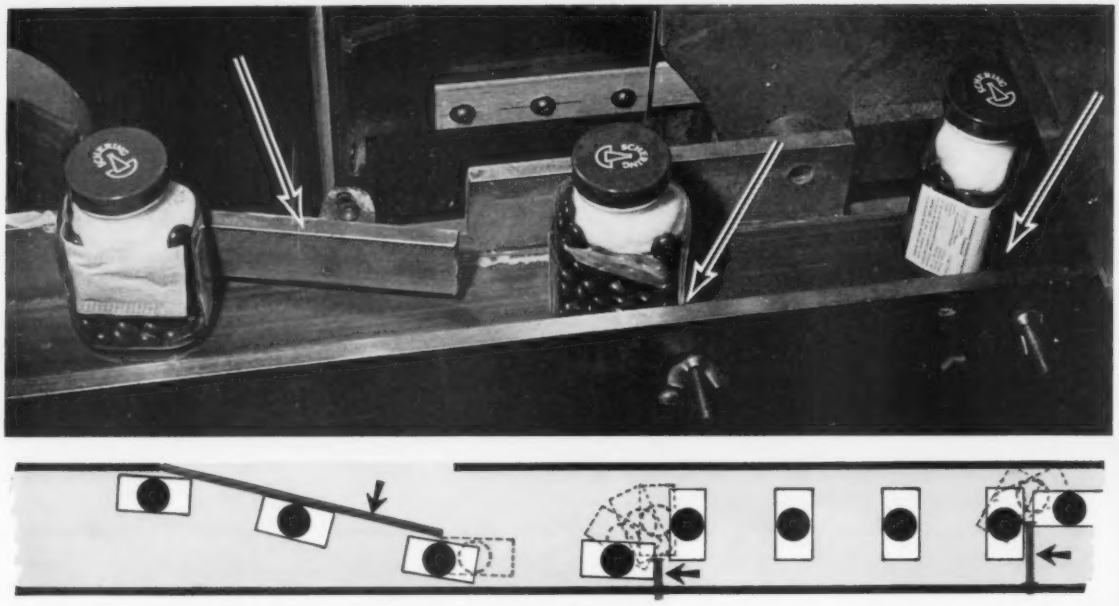
ACCUMULATOR PLATFORM IS SAFETY DEVICE (arrow, left photo, "A" in diagram) which stops capper if bottles back up from labeler, in which case they are forced against gate ("B" in diagram) which swings out over platform. End of gate strikes Micro Switch ("MS" in diagram) which stops capper motor. Note in diagram how bottles push out onto platform. **TRANSFER GUIDES** (arrow, right photo, "C" in diagram) lead bottles from one conveyor to another (conveyor ends overlap) eliminating necessity of having conveyors timed perfectly with one another. A set of these guides is used for transferring bottles from filling operation to capper, and labeler to cartoner.

bottles from one conveyor to the other, we installed a set of transfer guides which consist of paralleled steel bars spaced properly for the thickness of the bottle. We also have the same arrangement for transferring the bottles from the capper to the labeler conveyor and from the labeler conveyor to the cartoner conveyor.

Accumulator Stops Capper

When we first started up the line, we found that, if the labeler stopped, the column of bottles feeding the labeler would start backing up and stop on the capper conveyor. This, in turn, would cause trouble on the capper, such as excessive wearing of the rubber discs from friction against the bottle cap.

To solve this, we installed a small accumulator platform protruding out from the side at the discharge end of the capper conveyor. This platform holds about a dozen or so bottles. A portion of the guide rail immediately adjacent to this platform is mounted on a hinge so it will swing out over the platform



TWO PINS AND GUIDE RAIL (arrows) make up device for turning bottles 180° to position labeled side of bottle properly for cartoning operation. Bottle approaches from left, striking angular guide rail which forces it to opposite side of conveyor belt. Moving forward, bottle side contacts stationary pin (center arrow) which tends to stop bottle, but continuously moving conveyor belt causes bottle to pivot approximately 90° clockwise. (See diagram for motions.) Bottle continues to second pin (right arrow) and similarly is pivoted another 90° clockwise, thus making label face proper direction for cartoning.

if the bottles begin to back up. When this "gate" opens, its end strikes the shaft of a Micro Switch which is wired in series with, and cuts off, the power unit on the capper.

Following the capping operation, the bottles proceed to the Pony Express labeler. Here, it enters the labeler turret which in turn moves it to the label pick-up and two pressure stations. This unit has a vacuum pick-up to remove the label from the label magazine, move the label over the glue applicator, and deliver the label to the bottle. The two pressure stations press the label securely on one face and completely down both sides of the bottle.

Device Turns Bottles 180°

Leaving the labeler, the bottles are facing in the opposite direction from the way they should be for cartoning. We rigged up a simple means of turning the bottles around 180°. It consists of an adjustable guide rail (adjustable for different bottle sizes) at the beginning of the conveyor to the Redington semi-automatic cartoning machine and two pins for rotating the bottles. These pins are of different lengths and project out horizontally from the guide rail opposite the adjustable guide.

It operates like this: As a bottle enters onto this conveyor and follows the adjustable guide, this guide, positioned properly, forces the bottle over against the opposite guide rail. As the bottle rides along touching this latter guide, it strikes the first pin (a short one) which causes the bottle to pivot approximately 90° as the conveyor is carrying the bottle forward. The next pin, which is a little longer than, and located several inches beyond, the first one, catches the corner of the bottle and pivots it another 90° in the same rotating direction, thus positioning the bottle in the proper manner for inserting into its carton.

After the bottles are cartoned, single-faced corrugated liners are inserted at the back of the bottle to provide sufficient protection against breakage. The cartons are then automatically closed and passed on to the packing table for casing.

We also pack bottles in a nested pack of six bottles which does not require the use of a cartoner. In this instance, we have a bypass on the end of the conveyor feeding the cartoner so that the bottles pass directly to packing table. (*End*)

Franklin Baker was graduated from Cornell University with a B.S. degree in administrative engineering. Prior to joining Schering Corporation in 1956, Mr. Baker was associated with General Foods (doing time study work), Bakelite Co., and United States Plywood Corp. He is a member of the Cornell Engineering Society.

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IN TIPPER NO. 1, TV set is rotated counter-clockwise for bottom padding and sealing. From here, package moves to tipper No. 2 for final packaging and for return to upright position.

PACKAGE IS COMPLETED ON TIPPER NO. 2 before its return to upright position for outgoing movement on conveyor. Note that conveyor rollers in tipper housing match rollers of floor conveyor. Circular rims of tippers move on roller bearings.

Rotating package "tippers" replace manual inverting

Packaging effectiveness often depends on simple, practical shortcuts on the production line—especially those which cut down human effort. The pair of tipping devices described below makes an easy job out of package and product inverting, prevents injury to people on the line and sets being packaged, and frees manpower for more useful work elsewhere on the line.

By developing its own set of rotating package "tippers," Packard-Bell Electronics Corporation, Los Angeles manufacturer of radio, television, and high-fidelity sets, has now eliminated use of manual labor to invert its heavy products and containers for packaging operations. Doing this (1) prevents injury to individuals through heavy lifting, (2) prevents damage to packages and contents, (3) facilitates a packaging line flow of work, and (4) cuts in half the manpower necessary at this station—thus freeing packagers for more productive work elsewhere along Packard-Bell packaging lines.

Under its old method, the plant had a pallet rack system, and packaging line crew members manually lifted the different radio, TV, and hi-fi sets, turning them over (and then back again) in the course of packaging, closing, and sealing the ends. It was necessary to have two men, one on each side.

Old Way Time-Consuming

A particular problem was that the old way made the product extremely vulnerable to damage through dropping. A fairly slight drop meant injury and damage to a relatively expensive product, and in the course of being careful, crew members had to take plenty of time for this job. There was frequent slowing down and backlogging of product on production lines.

Tipper "Fits" Into Packaging Line

To eliminate all this, Toby Paris, final assembly foreman, Ken Brown, jib and fixture foreman, and Willard Van Barenm, production department superintendent, hit on an inverting method. Under their direction, two tipping devices were built in the Packard-Bell plant.

Basically, each unit consists of two tubular wheel-like rims, 7-ft. in diameter, (each around a housing). Housing has ¾-in. plywood sides, and there are conveyor rollers, top, bottom, and side, that match the rollers of the packaging line conveyor system into which each tipping unit fits.

The tubular rims move on roller bearings. A tipper stands in upright position, and a packaging crew member rolls in an approaching set on a pallet – with the corrugated box and other packing members already slipped in place over the set. It moves first into tipper No. 1, is turned upside down, after which it is moved out and along the conveyor line into tipper No. 2. The next operations take place there, including positioning of bottom packing, closing of flanges, and sealing with a single strip of reinforced, 3-in., gummed tape.

Next, a crew member inverts the set in tipper No. 2, thus returning it to upright position. He then rolls it out of the unit and onto the outgoing conveyor for movement to the plant shipping department.

75 Per Cent More Efficient

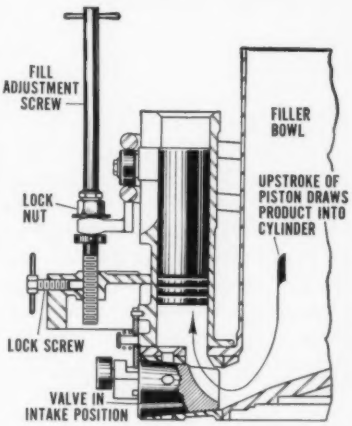
Now the only problem is that turning the tippers by hand involves "a bit of a drag," company production men say, noting the inertia involved. Next phase of their project is to mechanize the turning of the tippers to do it by power, rather than by hand. But even with the present manual tipping, they assert that the method is 75 per cent more efficient than the old manual method.

One man does the job and does it more easily and efficiently than two men did before. The operation runs smoothly; no set has to leave the conveyor line or be lifted by packaging crew members during the packaging operation.

Pallets carry sets only to the tipping equipment. Each set approaches tipper No. 1 on a pallet, and after being moved through this tipper, the crew member removes the pallet and puts it on a dolly for return to the start of the production line. *(End)*

HOW TO MAKE A FILLER PAY ITS OWN WAY

Take a walk with us around a Pfaudler rotary piston filler and you'll see why many of our customers make the machine pay for itself in a year or two of operation.



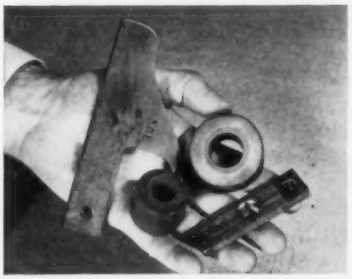
FAST FILL—NO SPILL. Look first at this piston design. It has just the right combination of smooth fit and small "cushion" to let you fill even very light products right through the range to heavy, viscous fluids. There's no surging. No splashing. No piston leakage. Accuracy is guaranteed on all sizes to ± $\frac{1}{10}$ fluid oz.

You can accurately adjust the amount of fill without dismantling or even stopping the filler.

While you're looking, notice that none of the parts are within or over the bowl . . . this eliminates any possible contamination from lubricants.

HALF-HOUR CLEAN-UP. One man can clean a Pfaudler filler in *one-half* hour. He needs no tools or hoists. He removes only two parts . . . piston and valve . . . to make ready for complete cleaning. He makes no adjustments after cleaning. No gaskets to clean and refit.

Even on our largest filler there are only twelve grease fittings—all located in one convenient header. All gears are submerged in oil, so they require little maintenance.



LOW-COST REPAIRS. There are only four primary wearing parts on these fillers—piston and valve rollers, valve trip cams and valve-lock wear pads. All are small, inexpensive, easy to stock and replace.

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For more information circle No. 227 on Reader Service Card, Page 83

Headlines from the 1959 Packaging Institute forum:

Professional Award conferred on Dr. Frank C. Campins, Polymer Industries, Inc.
Corporate Award conferred on Ethicon, Inc.
Technical Operations Committee Award (for most informative paper at forum) conferred on Dr. John M. Sharf, Armstrong Cork Co.
PI's first honorary member elected: Roger V. Wilson, Continental Can Co., Inc.
Next year's forum: October 31-November 2, 1960, New York.

Highlights of this year's PI forum and PMMI show

An expanding membership, financial solvency (with cash surplus), and stepped-up meeting activity—these characterize the current condition of Packaging Institute, members learned while attending the annual business meeting held during PI's 21st Annual National Packaging Forum in New York City in November.

Reports on membership indicate that, for the first time, the institute has more than 1,000 members (all categories) with greatest gains being in professional members—there now are 410, compared to 165 earlier this year. Further, PI predicts having more than 500 corporate members by the end of 1960.

There now are 28 technical committees functioning, including three formed in 1959 (aerosols, resins, folding cartons), and two more are about to be formed (food additives, military packaging). During the year, PI groups and committees held more than 100 meetings in over 50 cities, and involving some 450 people.

Noting the success of professional members' meetings held in 1959 (100 of the then 200 members attended one in February, and 150 of the then 300 members attended one in October), PI announced there will be four meetings for professional members in 1960.

Officers for the coming year include Charles W. Kaufman, National Dairy Products Corp., re-elected president; L. H. Zahn, Ciba Pharmaceutical Products, Inc., vice president for membership; Harold Mosedale, Package Machinery Co., vice president and treasurer; Dr. L. E. Simerl, Olin Mathieson Chemical Corp., vice president for committee activities, and Roy W. Abling, Merck Sharp & Dohme, vice president in charge of 1960 forum.

New directors of PI include Roy W. Abling, Merck Sharp & Dohme; Walter C. George, Gaylord Container Corp., Div. Crown Zellerbach Corp.; William Didriksen, Ekco-Alcoa Containers, Inc.; William R. Huguenin, Stokes & Smith Plant, FMC Packaging Machinery Div.; Dr. L. E. Simerl, Olin Mathieson Chemical Corp.; and Robert N. Johnson, The Kroger Co.

PI's 22nd Annual National Packaging Forum will be held October 31, November 1 and 2, 1960, at Statler-Hilton Hotel, New York City.

The 1959 forum featured seminars on production line and machinery, research and development, printing, drug and pharmaceutical, industrial packaging, food packaging, closures, and marketing.

Production Line And Machinery

Having a machinery development group within a company is very much like using consultants, George M. Woodruff, General Foods Corp., told the production line and machinery seminar. But "the farther away" such a group is from the local staff (at operating plant level) the more complex it all becomes, he noted. And regardless of which group does the job, "we haven't scratched the surface" of packaging line performance, he explained, commenting that thinking and planning should be in terms of 500 to 1,000 containers a minute.

Noting that acceptance of a new line (prepared by the development group) is up to the local manager, he asserted that it is essential for development engineers to follow a project all the way through to its acceptance. Further, an engineer doing such work must be isolated from day-to-day production responsibilities in order to get the job done, Mr. Woodruff concluded.

A prospective purchaser should be familiar with all available machinery, R. Ross Kitchen, Glenbrook Laboratories Div., Sterling Drug, Inc. asserted. Stressing the partnership that should exist between user and supplier, Mr. Kitchen urged development of complete written specifications spelling out all details—adding that this is particularly important where units from different suppliers are to be close-coupled in one line.

He warned his audience to main-

tain good relations with the plant union where one exists. Pointing out that, while the existence of a union means less flexibility in assigning and transferring people, it also means help in getting a full day's work out of union members.

Need for an unbiased approach often dictates use of a consultant in production line development, Walter Friedman, Dasol Corp., pointed out. Consultation can help settle key questions involved in deciding whether or not to invest money, he noted, explaining that an outside viewpoint may help in quickly reaching such decisions as the redistribution of work among existing crews, or in deciding on specially developed equipment.

A manufacturer of machinery, too, can be a consultant to a user, Walter M. Young, Richardson Scale Co. told his production line and machinery seminar audience. Pinpointing a problem often permits use of much standard machinery supplemented by only limited use of specialized equipment, he noted. He directed attention to a trend to the engineering of automated and semi-automated *systems*, stressing the importance of the system concept.

Pro's Of Roll Labeling

Reviewing the trend to roll labeling rather than use of loose or cut labels, William Dunlop, Jr., Wyeth Laboratories, declared that human vigilance is eliminating many errors, but that the ultimate depends on mechanical and electronic methods "taking over." He also pointed out that quality of printing is "a first and most important" point in label development.

Major efforts should go to (1) increasing the efficiency of semi-automatic units and (2) improving the use of punch holes in labels. Looking at the economics of roll labeling versus cut labels, Mr. Dunlop said the break-even point for ready-to-use labels is around 50,000 labels and that, in orders upwards of a million, roll labels run 10 per cent less. He warned that comparison of purchase prices should be offset by handling, inspection and use costs in a plant.

Labeling's Critical Points

Product shelf life and the number of items produced on a line govern labeling practices, Ralph Flohr, The Kroger Co., asserted, noting that plants are striving for higher speeds and standardization of containers. He said there are fewer problems in lines running at speeds less than 100/min. and that labeling is more critical on lines running 100 to 300/min., where changeover and start-up adjustments are more critical.

Mr. Flohr urged establishment of supplier identity codes for labels and advised making change parts of simplest possible design to facilitate changeover.

Calling for "near perfection" of labeling with a minimum of handling, Irwin H. Sipherd, National Distillers and Chemical Corp., directed attention to special problems of labels on bottles. He described the difficulties of labels falling off due to glue crystallizing and turning to powder, and reviewed the efforts of a Packaging Institute subcommittee on adhesion to glass to work out tests and specifications.

The most important test is that of permanency of bond, but tests of open assembly time (measuring the time for the glue to dry out) also are important. He cited the value of the PI checklist as a tool leading to elimination of complaints about label adhesion failure.

Research And Development

Stressing the importance of new concepts, Dr. M. A. Miller, Aluminum Co. of America, told his audience that a leading trend is in the adhesion of fade-resistant lacquers to aluminum foil. He also predicted many new developments in the use of aluminum, and cited the progress in foil itself: Typical of today's foil is a WVTR of 0.08/100 sq. in./24 hr./100°F. at 96 per cent R.H.

He predicted greater use of aluminum foil in folding cartons. Also, rigid foil containers now represent

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TABLET UNIT PACKAGER

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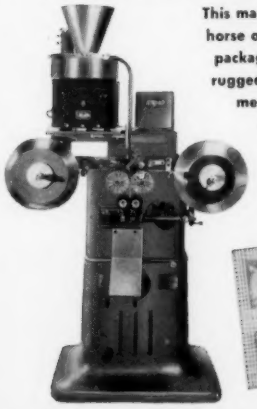
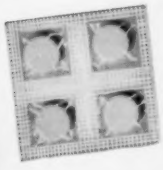


This machine is the workhorse of the tablet "strip packaging" industry. Its rugged construction and mechanical simplicity make it a favorite of leading pharmaceutical firms.



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a major use, he noted. Hermetically sealed covers are "next," and a composite can (foil-board-foil) is now a serious contender against all-aluminum cans.

Ten points deserve special attention when developing rigid and semi-rigid containers, according to Dr. John M. Sharf, Armstrong Cork Co. These are: (1) mechanical strength; (2) resistance to package contents; (3) thermal resistance; (4) water vapor transfer; (5) gas transfer; (6) permeation; (7) environmental stress-cracking; (8) resistance to micro-organisms; (9) container inertness to food and drugs; and (10) light transmission characteristics.

Dr. Sharf warned his audience against extending unwisely the use of data where not warranted, a common pitfall in package development. He urged setting up as a general standard the concept of an ideal package that maintains its contents in their original condition —without regard to intervening time.

There is a continuing trend to printed wrapperless cartons, Willard H. Gehrke, Marathon, Div. American Can Co., asserted. He declared that this is one aspect of a trend to simplification of packaging operations by users. Discussing improvements in carton development, he cited the use of trailing blade coaters in putting a good printing surface on Fourdrinier board. Further, development of new carton finishes for paperboard (such as hot melts and varnishes as well as more use of lacquers) is important. Mr. Gehrke declared that new carton locks to speed up closing and the use of dielectric sealing also are present trends.

Some Future Needs

Trends are "slow and natural developments" in leading to better containers, materials, test methods, and specifications, Dr. James W. Goff, Michigan State University, asserted. He warned that the packaging field is hampered by lack of adequate data and by the unwise application of existing tests. There is a need of getting rid of outmoded standards and avoiding the "copying bodily" of test or specification details from one application to another.

What is needed, according to Dr. Goff, is to pull together, classify, and extend the information "we now have haphazardly" and he predicted that much research can take place only at research institutes and at universities. He cited the growth of such programs for research as are now being planned for Michigan State—projects where some 40 sponsors will pay $25,000 each—to participate in projects and share in results.

Trends In Europe

There are trends to better packaging in every field in Europe, Pierre J. Louis, French Packaging Institute (Paris), told those attending the research and development seminar. At the same time, European companies are not fully prepared for the impact of the common market on packaging, and he said that American companies have "a big opportunity" in Europe. They will encounter European regulations and practices, but they also will find real cooperation in working with the common market serving 160 million people.

He noted a trend to more moisture-resistant fibreboard boxes, and the greater use of microcrystalline waxes and laminations—as well as polyethylene linings. He also cited improved treatment inside a metal drum to resist shock to contents. Particularly in consumer goods, there is more use of plastics and "a lot of" polymer-coated cellophane. Tubes of unplasticized PVC (which may be saran-coated on the inside) are growing in use, but not for food, Mr. Louis noted. Other packages of interest include molded excelsior bound with glue, snap-in tops for aluminum cans, and oriented rubberized hair for cushioning. He said that French laws are "about the same" as in the United States in regard to toxicity of materials.

(*Turn page*)

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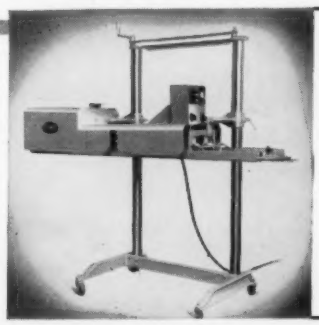

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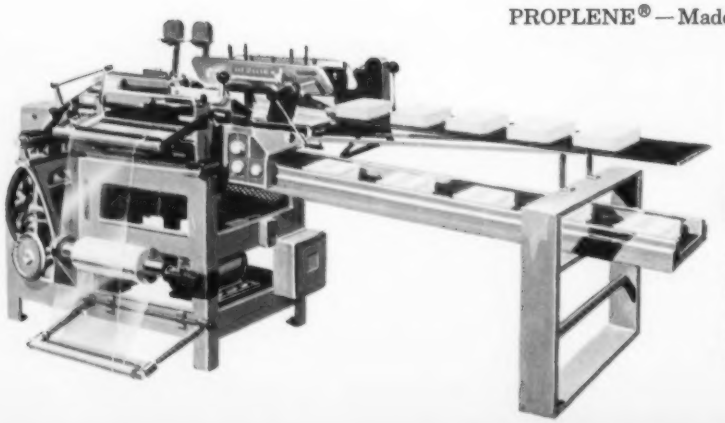

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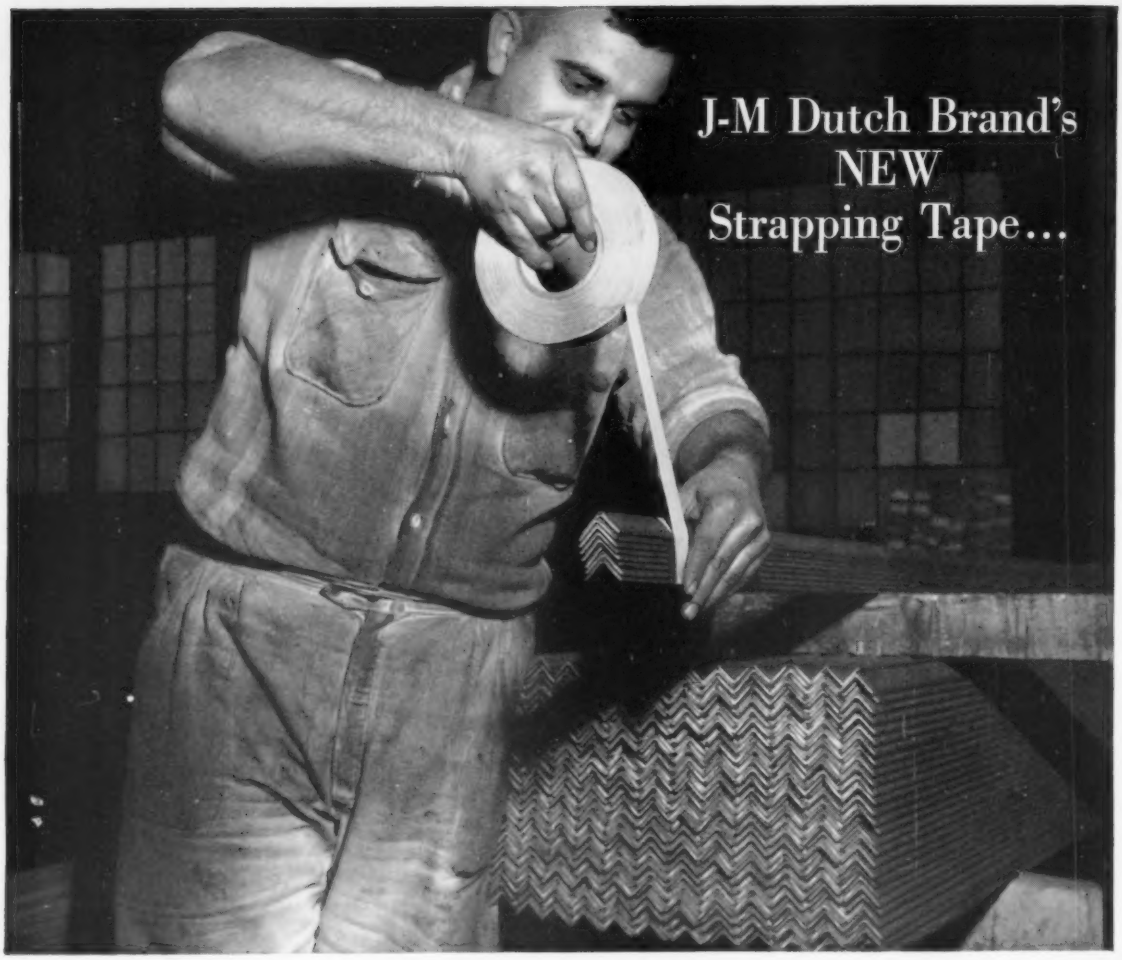

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PMMI Show

These trends—less "changeover parts" or none at all, automatic size adjusting (especially on case sealers), still maintaining high rates of speed—characterized the 1959 Packaging Machinery Manufacturers Institute Show held at the New York Coliseum. With about $3 million worth of packaging machinery displayed by 159 exhibitors, recent developments demonstrated give promise toward improved efficiency, higher speeds, more accurate filling, better sealing, among others, on the packaging lines of tomorrow.

Cross-Section Of Machinery Developments

A single machine to automatically form and trim thermoplastic sheets, introduced by Atlas Vac-Machine Corp., has a forming area 20x20 in., operates at 10 cycles /min., and uses female molds. It automatically indexes the formed portion of the sheet to the trimming section of the machine, thus maintaining register for trimming, and ejects the finished containers.

Utilizing a single track for tablets, capsules, and similar products, an electronic counting machine was shown by Lakso Co., Inc. Each tablet passes by an electric eye which operates an electronic counter. When the pre-set quantity is reached, the counter sends an impulse to a gate which directs the flow of product to an alternate filling head, then re-sets itself to zero. Maximum bottle indexing speed is between 50 and 60/min.; operating speed is 1,500 tablets/min. Designed for fast size changeover, the automatic bottle indexing conveyor handles bottle sizes from small vials up to 8½ in. high and 4½ in. in diameter.

Designed specifically for thermoplastic tubes, an automatic machine was demonstrated by Carbert Mfg. Co., Inc. It fills and seals up to 120 tubes/min., requires no change parts to seal any type of tube—polyethylene, polypropylene, etc.—and only three change parts for different tube sizes.

Featuring an auger type feed, a continuous powder filling machine was displayed by G. Diehl Mateer Co. With 20 filling stations, the machine has a minimum production rate of 120/min., allowing an 8-sec. filling cycle. Designed for almost any type of dry product, the filling area is completely enclosed to permit air-conditioning of the atmosphere around the product during filling.

A so-called "portable" web splicer was shown by Butler Automatic Machine Inc. Designed to be mounted on existing wrapping equipment having two feed spindles, or where a second spindle can be installed easily, it operates in any position, and can be equipped with necessary extended tubes and brackets for mounting.

Built for heavy-duty bundling, a machine for tying such items as boxes, bags, and other products was shown by United Shoe Machinery Corp. With an operating speed of 20 cycles/min., an effective tying rate of 15 bundles/min. is obtained, the maker says. The machine is designed to handle packages up to 24 in. high and 38 in. wide.

A combination pressure or gravity filling machine to handle a full range of aerosol cans and products was displayed by Horix Mfg. Co. For gravity filling, it handles 205-225 cans/min. for several sizes ranging from 6 to 16 oz.; for pressure filling, 200-210 cans/min. for 16-oz. sizes. Designed for fairly viscous products, the machine will also handle glass jars.

For imprinting labels, a new rotary imprinter was exhibited by Oliver Machinery Co. Simple to operate, the machine can be installed on Oliver labeling equipment, has a minimum label capacity of 1¼-in. cut-off by 1 in. wide; a maximum of 3-in. cut-off by 5 in. wide; and imprints at speeds up to 200/min.

Demonstrating flexibility for different types of cellulose bands, a high-speed band-applicating machine was shown by Gisholt Ma-

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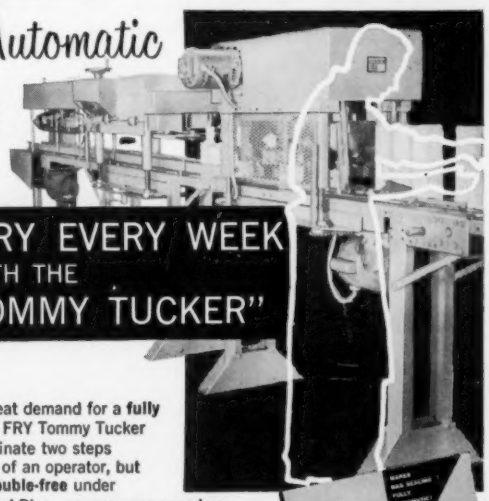

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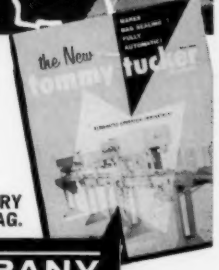

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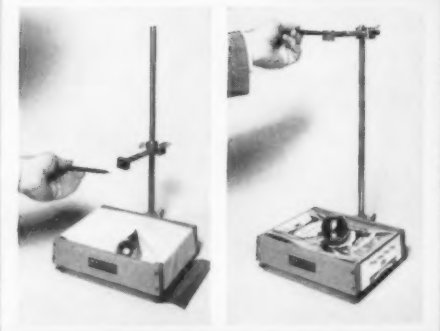

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chine Co. Requiring no changeover or adjustment for band types and different manufacturers' products, the machine will run at a speed of 120 bottles/min. for glass up to 3 in. in diameter, 13 in. high, with bands to 45x45 mm.; at 85 bottles /min. on glass up to 7½ in. in diameter, 13 in. high, and bands to 65x65 mm.

For users whose packaging lines do not warrant high speed and fully automatic machines, a new carton forming machine was introduced by the Robertson Paper Box Co. Low in cost, the equipment permits quick size changeovers and operates at a rate of 1,000 cartons/ hr. Carton blanks are pre-coated with dry adhesive which is activated by heat to effect sealing.

For tighter crimping of aluminum foil lids on aluminum containers, a new machine, displayed by Reynolds Metals Co., positions and crimps foil covers on a wide variety of aluminum containers, and utilizes less material because it handles roll stock instead of precut sheets.

An automatic, high-speed, electronic checkweighing machine was introduced by Stokes & Smith Plant, FMC Packaging Machinery Div., and weighs and segregates packages at speeds up to 400/min., accuracies to ±0.25 per cent of the gross package weight, according to the maker. A three-way reject system separates over, under, and acceptable packages with a positive action which prevents spillage from open containers.

Requiring no size changeover parts, a banding machine was introduced by Schooler Mfg. Co. for banding cartons, bars of soap, etc. It operates at a speed of from 27 to 55 bundles/min. depending on unit size. Changing size takes about 1½ min., and size range is ½ to 4 in. in height, 3 to 12 in. in length, and 1¼ to 7½ in width.

Based on the principle of continuous motion design, a vacuum-forming machine, exhibited by Sundstrand-American Broach, forms most thermoplastic materials into a container and applies a top board as its cover. The machine operates

at a speed of 300 lineal inches of material per minute. Interchangeable mold assemblies allow size changeover time of about 20 min., or the individual molds can be changed, depending on mold sizes.

To form trays from oriented polystyrene sheet, a newly developed tray forming machine was exhibited by R. A. Jones & Co. Tray size ranges are covered by two machine models, and include those found in conventional paperboard tray forming machines. Operating speed ranges from 40-100 containers/min. depending on tray size and relative dimensions.

A non-stop piston filler with twin filling heads that travel with the containers being filled, was exhibited by Elgin Mfg. Co. Product flows through lengths of Tygon tubing, from the reservoir to the filling heads. After filling, heads return to the next containers in line.

Receiving random sizes of cases and providing a rotating compression section, a new case sealer was demonstrated by J. L. Ferguson Co. The circular compression unit automatically sorts cases according to height, and discharges them to any desired outgoing conveyor line. It handles cases ranging from 24 in. long, 22 in. wide, 18 in. high to 8 in. long, 6 in. wide, 6 in. high. Several lines can feed cases at random to this unit.

Featuring a new principle of operating drawbar with a smooth crank motion that permits a shorter stroke (and thus higher speed), a new form-fill-and-seal machine, was exhibited by Package Machinery Co. It operates at speeds to 75/min. with cellophane, and 60/min. with 0.002-in. polyethylene. It has air and electrical drives and quick-change integral-unit sealing jaws.

Designed for net weighing of granular products, flakes and chips, and operating in a continuous, rotary manner, a new Olofsson scale was exhibited by Bartelt Engineering Co. Running at speeds to 70/min., it has eight stations, with each weigher on the turret, has a cup-and-pan action, with the bulk of the product going through cup and the excess being added or removed by the pan—all taking place to attain desired weight while the unit is in motion.

Featuring automatic size changing, a machine for taping shipping containers, shown by General Corrugated Machinery Co., Inc., consists of three sections which adjust automatically and independently of one another to case size, thus allowing random sizes to be fed to the unit. The first section senses case size and folds inner flaps; the second folds outer flaps; the third applies tape and presses it down.

Featuring a flexographic printing unit, a new corrugated box printer, exhibited by Industrial Marking Equipment Co., has a continuous, uniform flow of ink in order to assure uniformity of impression throughout a run, according to the maker. Each such machine is built to a user's requirements, but features common to all units include stacking for automatic feed, and interchangeable rubber plates.

To provide a pressure-sensitive tape closure for a film bag, equipment exhibited by Lynch Corp. combines a product conveyor with a form-fill-seal package maker. Product items move in can-like conveyor pockets to the filling station. But, instead of receiving a heat-seal top seam, each package moves through a transfer device to a Platt tying unit which takes (from a roll) a length of pressure-sensitive tape and secures the top closure.

Featuring versatility, a portable automatic labeling machine for round containers was shown by Long and Co., Inc. Equipped with vacuum label pick-up and a label magazine for 6-in. stack of labels, the machine handles round cans, bottles, etc., from 1 to 7 in. in diameter and 2 to 10 in. tall. No changeover parts are required as label and bottle guides are easily changed by thumb screws. Machine handles labels from 1x2¾ in. up to 10x24 in.

The PMMI Show of 1961 *will be held at Cobo Hall, Detroit, October 31 through November 3. (End)*

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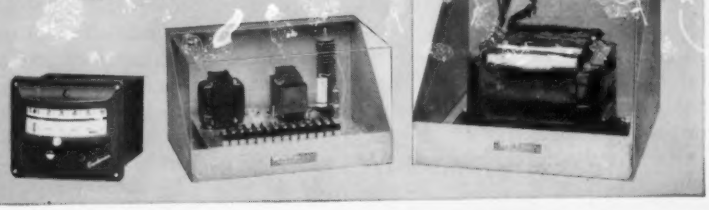

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It frequently happens that the best of advance calculations fail to work out when put into action. Mr. Horton's experience in developing a method of supplying a wet, irregular, slippery product to packaging line crew members bears this out. His use of two parallel belts as a means of product supply and work load balance should help others facing these problems.

"Endless" conveyor table improves fish fillet packaging

By Raymond E. Horton,
Packaging Supervisor,
Cape Ann Fisheries, Inc., Gloucester, Massachusetts

During our company's change toward small-unit packaging of fish fillets, a number of problems had to be solved, foremost of which was developing a suitable table for placing fillets into cartons and adjusting their net weights. When an automatic wrapping machine was first acquired, it appeared to be an easy proposition to simply weigh the fillets into cartons and let the machine do the job which had previously been done by hand.

Filling of the cartons, weighing them, and the inspecting of each fillet was, of necessity, a manual operation. No machinery has yet been devised which can weigh a series of limp, irregular, wet fillets into a carton and inspect each fillet for possible imperfections.

Our first packing table was 30 ft. long and 3 ft. wide. Greater length would have been desirable, but the available space precluded it. **All calculations led us to believe that 22 girls would be needed to perform the job in an efficient manner.** It was obvious that they would be working close together, but there was no way in which this could be avoided. The table top was to be used for the scales and empty cartons, but there was no place for the pans of fillets which weighed 15 lb.

Devise Supply Pan

Special pans were designed for the job, rectangular in shape and 6 in. deep. The back of the pan was extended, then bent back to form a hook. The distance between the actual pan-back and the hook was ¼ in. Along both top edges of the table, a bar of metal ¼ in. thick was fastened in a vertical position. By the use of spacers this bar was kept 1 in. away from the table. The hook of the pan was fastened onto this bar, between the girls and, because of the strength of both bar and pans, they remained in place.

Two handy men were assigned to the department and instructed that each of them would supply fish to the girls on one side of the table only. The packers were told to notify the man assigned to their side to bring more product by simply calling him or by placing the empty pan on the table top. In prospect, everything pointed toward a very successful operation even without any mechanical equipment to help in the production.

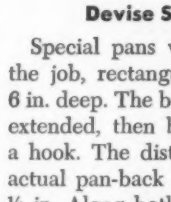
System Didn't Work

It required only a few days of operation to realize the errors and miscalculations made in planning. When the first girl on either side of the table emptied her pan, invariably, two or three others would do the same, and were forced to wait. The two handy men would rush to keep up with the demand, but it was impossible. Things that were not anticipated began to happen. The pans were heavy, wet, and slippery and the handy men lost control of them. Many times the pans fell to the floor and the fillets in them were a total loss.

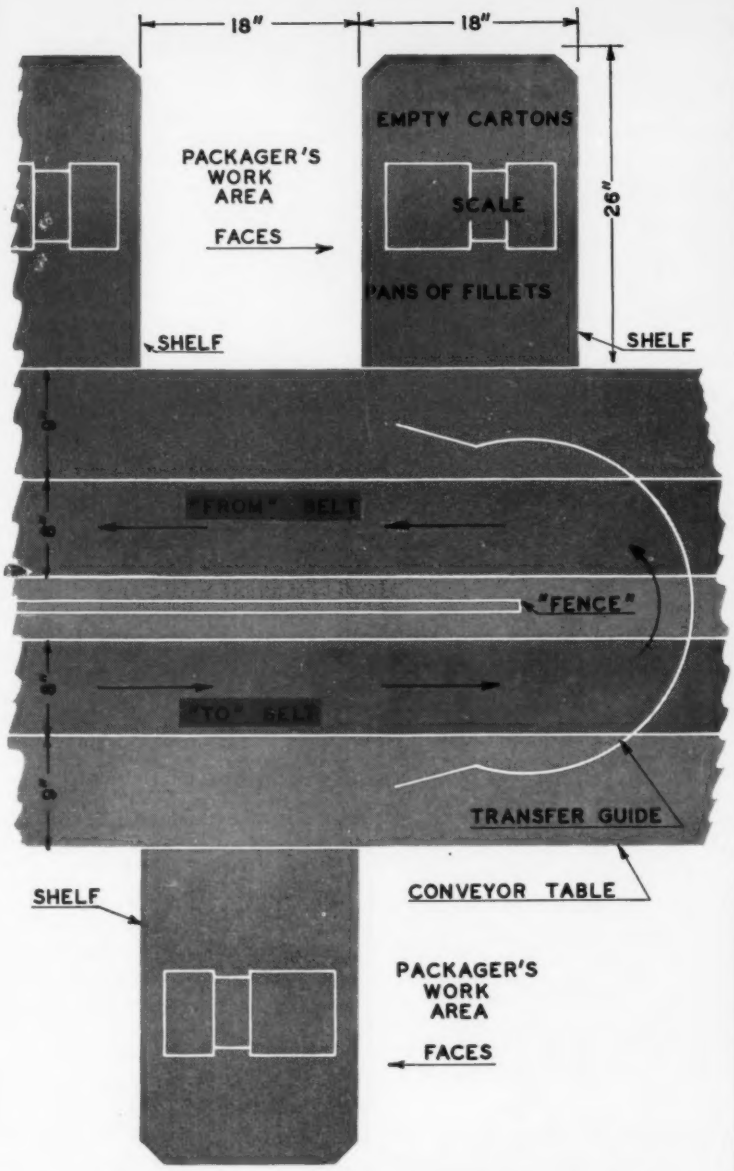
The men delivering the fish to the girls found that they had to maneuver through narrow spaces between the girls at their working stations. There were many complaints; these men could not help but brush against them with their wet apron and boots. Because of the congestion around the table, the accident hazard was greatly enlarged and it was decided to reduce the number of girls employed in the filling operation. This did not help the operation because, even with 18 girls on the table, many again finished their pans simultaneously or would forget to put up their empty pan as a signal to the handy men.

Search For New Method

Because of the inability of the girls to get adequate supplies of fish fast enough under this system, our production was not up to the standards of what had been expected. There were many other factors that



Raymond E. Horton entered the fishing business in 1935 and since then has been associated with the various departments of the Cape Ann Fisheries, Inc. — including the handling of fresh fish for shipping or filleting and for packaging and freezing. In 1941 he was promoted to his present position making him responsible for the quality of the company's packaging and product.



1 PACKING TABLE HAS "TO" AND "FROM" BELTS separated by "fence," transfer guide, and shelves staggered on either side. Note size of shelves and individual work spaces. Arrows on belts show travel direction of pans. (Belts to take filled cartons to wrapping machine not shown.)

were contributing to the problem. We realized that it was necessary to revise our concept of small-unit packaging and still utilize the table we had built.

Summarized, at this stage, our main problems were these:

1. **Dropping** pans on the floor resulting in loss of contents.
2. **Inability** of two handy men to keep all of the girls busy, and the discomfort created by close quarters and congestion.
3. **Hazardous** working conditions created by the congestion and the inability to maintain any control of quality of production.
4. **Cost** of the male labor alone averaged between $21 and $30 a day, depending on the overtime that was necessary because of our failure to produce efficiently.
5. **Failure** to get the production that we had been positive our girls could produce, because of their inability to get the fish to package.

(*Turn page*)

One man crates 975-lb. fountain in 5 minutes... using the DUO-FAST STAPLE GUN

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How To Supply Product?

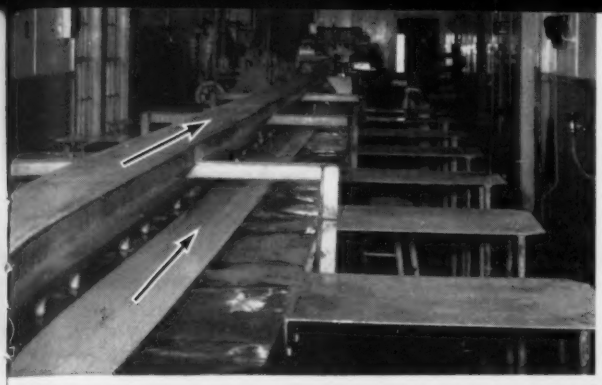
In view of these facts, at the first moment that work slackened off, our company officials got together to find a way to utilize the same table, but reduce the high cost of packaging. The principal problem was getting the fish to the packers; here the revised planning started.

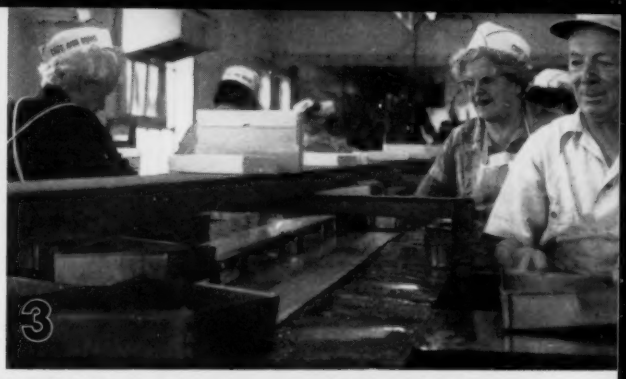
It was decided that the table top should be utilized in some way so that the fillets could be delivered to the packers by the use of belts. To eliminate the congestion, it was thought that a working area at least 3 ft. long should be assigned to each girl. This plan called for the installation of shelves projecting outward from the table and long enough to hold the packing scale, pan of fillets, and the cartons into which the product was to be packed. (See Figs. 1 and 2.) The space between the shelves would be the working area and the packer must be able to work with her right hand. It should be remembered that, owing to the limited size of the building, it was impossible to lengthen the packing table.

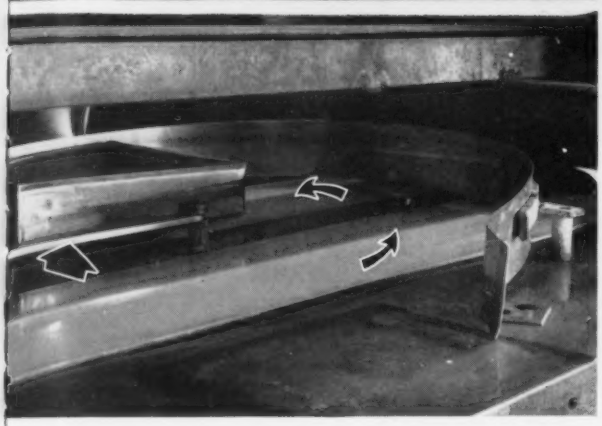
Use Powered Belts

The problem of supplying the fillets to be packaged was solved by placing two parallel power-driven conveyor belts on top of the table. These belts, 8 in. wide, travel in opposite directions and are separated by a "fence" to prevent the pans from touching each other as they travel around the table top. The so-called "fence" (see Fig. 3) is merely a steel bar supported on lugs about 2 in. above the table.

As the belts move in opposite directions, bringing fillets to the girls and taking empty pans from the girls, it is referred to in our plant as a "to-and-from" conveyor. It was also necessary to devise a method of transferring the pans from one belt to the other when they reached the ends of the table. This was done by placing a semicircular stainless steel guide (see Fig. 4) across the two belts. Working drawings were made of the desired set-up (see Fig. 1), and the table was modified accordingly.







NOTE HEIGHT OF BELT (Fig. 2) leading to wrapping machine. Packer can reach this belt whether sitting or standing. Lower belt is "to" conveyor. "From" conveyor is obscured from view. (Arrows indicate travel direction.) **MAN WHO REMOVES EMPTY PANS (Fig. 3)** and refills them awaits return of more empties. If he does not wait until they move around curve, he can reach over "fence" to pick them up. **STAINLESS STEEL, SEMICIRCULAR TRANSFER GUIDE (Fig. 4, see also Fig. 1)** on each end of packing table diverts pans from one belt to other. "Fence" (box arrow) prevents pans on the two belts from hitting each other as they travel in opposite directions. (Curved arrows indicate travel direction of pans.) **PACKERS CAN EITHER STAND OR SIT (Fig. 5)** at their work, even though entire unit is very compact. Note small space between packers, which is necessary.

From the beginning, the table has functioned perfectly, and the fillets travel to the girls with a minimum of effort. The empty pans return to the one man now employed to keep the operation going at full speed (see Fig. 3) on a normal day's operation. Many days when the production is increased, it has been advisable to have an extra man on the operation, but his cost is negligible because of the increase in production.

Supervision Easier

Although the new table has necessitated replacement of the old pans, which held 15 lb. of fillets and were 6 in. deep, it has made the problem of quality control much simpler to supervise. New pans were essential because of the lowered elevation of the take-away belt which carried the finished product to our Package Machinery wrapping unit. The undercarriage, which holds this belt, is only 5½ in. above the table top. Therefore, the pans had to be made shallower (3 in. deep) so that they could ride around the table. (See Fig. 2.)

By utilizing the principle of two pans for each girl engaged in packing, there is never an overload of fillets on the belts, nor are there any extra pans to be cleaned at the conclusion of each day's production. If 10 girls are on the packing table, only 20 pans will be ahead of them, and this represents only 200 lb. of fillets. By the same token, production should be great enough to keep the empty pans going back in plenty of time to handle the fillets coming from the filleting table on a lower floor.

The two handy men (normally used in the former operation) have been transferred from the packaging department to other jobs within the plant. One man usually can control the loading of the pans, filling the "to-and-from" belts, and removing the empty pans. (See Fig. 3.) There is no longer any congestion or confusion, and each packer's abilities are utilized to the utmost. Although there are only 18 working places available now, whereas the old setup contained 22, the increase in productivity has eliminated the need to occupy all working spaces at any time. Also, it is now possible for the packers to work standing or sitting (see Fig. 5), and each one takes a particular pride in keeping her work area clean.

Supervision is much simpler, quality is improved, and an accurate account of each employee's daily production is easy to maintain. Loss of fish or labor has been eliminated, and the change has been for the better. The success of the operation of the new packing table is regarded as a satisfactory way of packing fish fillets—a limp, wet, irregular product. *(End)*

Tailoring can system to meet product requirements

By **B. B. Lipske,** *Manager of Research, National Can Corporation, New York*

Each food or nonfood product to be packaged in cans presents special technical problems. Once the size and shape of the can are determined, specifications of plate to be used, organic coating, and construction of the end and side seams must be carefully considered. Furthermore, the product itself—its chemical and physical characteristics, its end use, and its reaction with the container during storage (which affects both product and container quality)—must be evaluated to determine what is required of the can.

It is practically impossible to give a "formula" whereby one may predict immediately that certain variables of can manufacture will be compatible with a newly developed product. Therefore, in this article, we are merely trying to acquaint you with some of the basic types of variables and the problems which are involved in determining the proper can to use.

Interior Coatings

The interior enamels used in cans are divided into two main classifications:

1. Sanitary enamels—for food products.
2. General line enamels—for nonfood products.

Numerous products, both food and nonfood, are successfully packed in containers having no other interior protection than the thin film of tin (0.000015 to 0.000100 in. thick) as applied to the mild steel, or, in some cases, a reacted film by chemical treatment of the base steel. The use of an organic coating on the interior surfaces of a metal container greatly increases its corrosion resistance, permitting the packaging of products that otherwise would not be possible because of their adverse effect on, or by, the metals in the container.

The coatings are applied to flat sheets by means of a roller coater, and are baked in continuous ovens at varying temperatures, depending on curing or baking characteristics. Generally, however, temperatures do not exceed 425°F. Roller application permits a uniform, carefully controlled amount of film. Depending on the type, weights anywhere from 1.5 to 7 mg./sq. in. are used. **These coatings vary in composition and purpose, and require extensive testing to determine their suitability for the product and/or end use.**

After the plate is enameled, it is made into cans. Manufacturing involves such operations as bending, drawing, and forming. Thus, the enamel must contain properties of adhesion, flexibility, and abrasion resistance.

Oil films and oxide films may cause trouble in coating of tin plate. Black plate, terneplate, and tin plate carry a light film of oil as a protection against atmospheric corrosion. Those generally used are palm oil, cottonseed oil, dibutyl sebacate, and dioctyl sebacate.

In cases of excesses, or poor distribution, of the oil film, lining difficulties such as eye-holding and crawling (de-wetting) are encountered. Unprotected or aged plate may result in trouble due to formation of oxides. Excessive oxides lower adhesion characteristics, affecting the final degree of service of applied organic material.

SANITARY ENAMELS

The basic sanitary enamel types are "C" (corn enamel), "R" (regular enamel), and phenolics. These are the more common ones and are used for food products such as corn, peas, fruit, meat, and fish. They must be nontoxic, and free from odors and flavors which might be imparted to the products—thus the term, "sanitary enamels."

"C" Enamels

The "C" enamels are oleoresinous types of which there are generally two: one for vegetables, the other for processed meat products and poultry which contain fatty ingredients. **Since the problem with the process reaction of the meat**

How do you select the right can system for a newly developed product?

Choosing the proper combination of can specifications for a given product involves a bewildering number of variables, such as:

- The chemistry of the base steel.
- Pretreatment of the base steel.
- The amount of tin coating.
- Whether or not the can is enameled.
- Interior enamel—resistance, coverage.
- Whether or not side seam is striped.
- Handling abrasion.
- The packing procedure.
- The storage temperature.
- Product's chemical makeup—impurities.
- Corrosive action of the product.
- Headspace and vacuum in container.

Thus, the proper system can only be found by pretesting using all the facilities available to the chemist and the packaging engineer.

and poultry products, which contain appreciable protein, is black tin and iron sulphide staining, it is necessary that the coating vehicle include 15 to 18 per cent zinc oxide to overcome this staining condition.

The zinc oxide is added to the oleoresinous vehicle, prior to its application to tin plate, primarily for its chemical reactivity: The sulphides which form during heat processing of protein-containing foods react with the zinc oxide to form a white stable zinc compound, rather than any objectionable dark discoloration on the interior of the containers.

"R" Enamels

Similar to "C," the "R" enamels also are basically of the oleoresinous types. They differ inasmuch as they are unpigmented and are generally formulated to have good barrier resistance between acid products and the metal of the cans. One of the basic resins used for this type of enamel is paraphenylphenol. The amount used, in combination with other synthetic resins and tung oil in a cook, will depend upon the acid resistance that is required for a given product.

The "R" enamels are used for a variety of acid products, either as part, or full, protection. Certain food products employ plain tin bodies with "R"-enameled ends. Although this combination is objectionable with many products, such as red fruits with which full enamel protection is required to prevent bleaching, there are instances where the presence of plain metal is desirable. The plain tin causes a bleaching action and improves the color of some products which normally would darken in a fully enameled can.

Phenolic Enamels

The phenolic enamels, with or without modification, are used for fish, certain meat products, pet food, etc. These enamels have greater impermeability and resistance than the other sanitary types. However, they are more sensitive to tin plate conditions and are less flexible for stamping and fabricating. When used for drawn parts, slight modifications are usually used to improve flexibility and adhesion

In the past, phenolics generally have been known to impart flavor to certain products, but flavor-free types have been introduced in recent years. An example is in spinach cans.

Specialty Enamels Or Systems

We now get into specialty enamels for specific end uses. Either a single- or two-coat system of enameling is used. The single-coating linings may be of the epon ester types, which withstand high temperatures. For example, the Martin asceptic process, whereby the cans are sterilized prior to filling with sterile fresh milk, requires a system which will withstand steam temperatures up to 450°F. At such high temperature, this type lining will not blister.

Two-coat systems vary with the use of different types of "R" enamels and epoxies in combination with a top coat of vinyl. The second, or top, coating is applied by conventional roller coating, or can be cylinder-sprayed and baked. Vinyls are tough and flavor-free, and accordingly, are suitable for a variety of products such as beer and carbonated beverages. Such products, in addition to flavor characteristics, are sensitive to metal and require full protection.

In the case of the latter product, epoxy type prime can linings are used to improve manufacturing characteristics. The second coat is a vinyl, usually sprayed on after the can body is made. Since grape juice, cranberry sauce, and similar types of products are sensitive to iron and/or tin, this type system is being tested for such products.

It is especially necessary to pretest noncarbonated (still drinks) formulated or blended drinks in order to assure protection and shelf life and eliminate variations in the

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same formulation. Sugar content, pH, and the presence of oxygen are controlling factors. **Particularly important is the amount of oxygen within the canned product, as it readily catalyzes corrosion attack.** Also, in such products as lemonade and orangeade, citric acid, ascorbic acids, and similar additives must be considered.

Vinyl in combination with one of the basic enamels is in the specialty class. It is usually a two-coat system, adapted for products that are adversely affected by the metals of the container, or for products that have corrosive tendencies. A typical example is a system having a base coat of "R" enamel and a top, roller spot coat of vinyl with side-seam striping (an additional coating striped on the inside of the side seam), used for apple juice.

GENERAL LINE ENAMELS

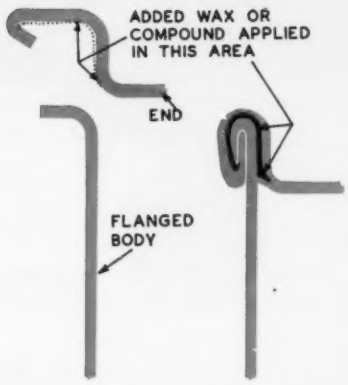
Special phenolic and epon-phenolic enamels are used for water-base paints such as polyvinyl acetate, rubber latex, acrylic, and casein types. As the name "water base" implies, these products are formulated with water and are **in a pH range conducive to rusting if in contact with exposed metal on the interior of the can. It is, therefore, important that the interior be coated with a lining which has high chemical resistance and impermeability to the ingredients of water-base paints.**

In direct contrast to this, **the oil paints are nonreactive to metal and are therefore packed in uncoated, plain tin cans.**

Motor oils present no specific problem in corrosion, and for reasons of economy **are packed in black iron cans.** However, **since plate of this type has very poor resistance to atmospheric corrosion, the container must have protection.** An inexpensive oleoresinous coating serves very well.

For Detergents

Liquid "light duty" detergents require *complete* protection from the metal components of the container. They readily attack the base metal and are seriously affected by any corrosion thus formed. **A pigmented or unpigmented prime coat of special phenolics, epons, or epon-phenolics, followed by a second coat of clear vinyl has proven satisfactory.** (*Turn page*)



"DOUBLE SEAMS," those on tops and bottoms of cans, are as important as side seams. Compound in crevice of lid provides "gasket" to assure tight closure; additional wax or compound in area as shown above gives more protection to enamel on flanged ends of can body.

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C U. S. SIPHON FILLER. Adjustable for all containers, all liquids including foamy products or products that do not permit agitation. Stainless steel tubes; glass lined tank. Request "Siphon Bulletin".

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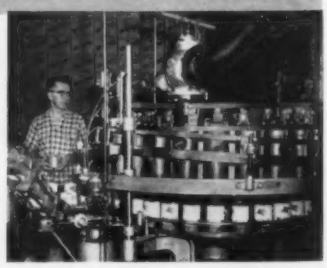

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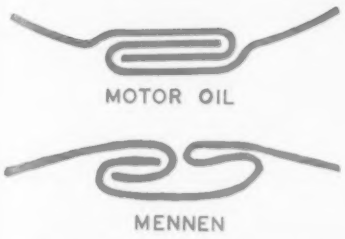
"Heavy-duty" detergents present a somewhat different problem in that they contain a sufficient amount of alkaline builders to prevent the corrosive reactions with the base steel. Since the tin coating of ordinary plate has relatively poor resistance to alkaline solutions, it would not seem practical to have it in contact with a product that would dissolve the tin coating in a short period of time.

In such cases the base plate is chemically treated instead of being tinned. This is a recent development. **The chemical treatment imparts a corrosion-resistant and product-resistant film to the steel sheet,** so that it is equivalent to tinplate in some uses. Accordingly, a container is supplied that holds the product, but does not require the protection of tin or an organic coating.



SEVERAL PHYSICAL DESIGNS OF SIDE SEAMS are used by can industry. Of the two above, top one sealed with solder is most common.

B. B. Lipske was graduated from Gettysburg College with a B.S. in chemistry and bacteriology. He also studied food chemistry at Gettysburg and took graduate courses at New York University. In 1929 he joined National Can Corporation and started its first laboratory. Mr. Lipske is a member of the American Chemical Society, Institute of Food Technologists, American Association for the Advancement of Science, and National Metal Decorators Association.

For Anti-Freezes

The permanent type anti-freezes must be protected from iron contamination or they will lose their effectiveness. The general enamel used for this product is a modified vinyl butyral phenolic. In a few instances, epon-phenolics are used. However, **before marketing a new brand or a revised formulation, no matter how slight the revision, it is absolutely necessary that careful pretesting be done.**

FULL ENAMEL VERSUS PARTIAL ENAMEL

Often one will find certain food products packed in containers having plain bodies with enameled ends. **This combination is determined by the flavor, quality, and appearance desired in the product; whether the product is light or dark in color when packed; product reaction, and product protection.**

Product Controls Combination

In other words, the given prod-

Smaller, 400 lb., L.A.B. incline-impact (conbur) package tester speeds test schedules, sets up anywhere

Ideal for relieving schedules on larger equipment or where only small packages are tested. Rubber-tired dolly and ballasted barrier minimize noise and vibration. Open barrier also available. Write for details.

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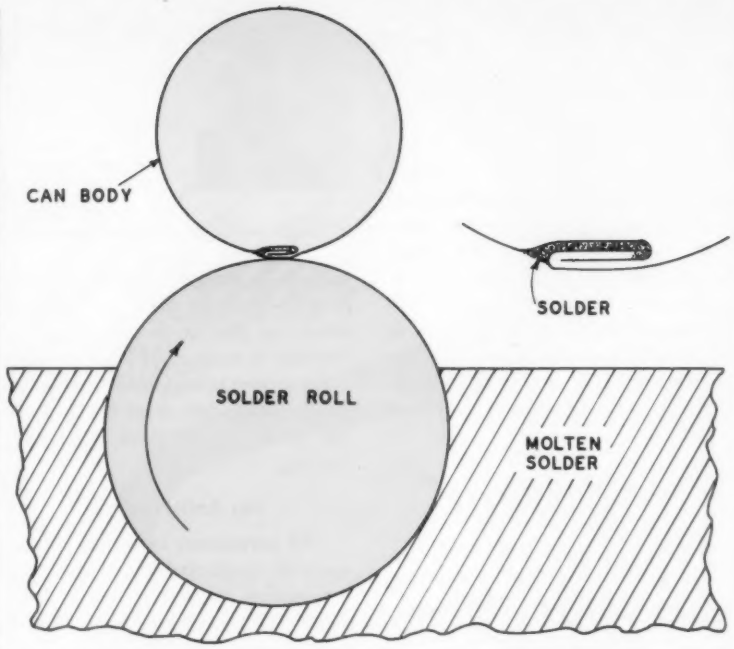

SOLDERING OF SIDE SEAMS is accomplished by seam's passing along, and coming in contact with, revolving longitudinal roll partially submerged in bath of molten solder. Small incisions, cutouts, or tabs may be formed in side seam to increase area of solder flow, strengthening can.

uct controls the combination used. Typical examples of this are asparagus, pears, peaches and tomato juice. **The plain body with exposed tin tends to bleach the color and overcome the slight darkening effect as the result of processing.** With asparagus, pears and peaches, a light product color is a desirable condition.

The same products, including tomato juice, in a completely lacquered can develop a slightly different flavor from that normally associated with these products. Not only does the exposed plain tin give a more palatable flavor, but it greatly increases the shelf life of these products.

SIDE-SEAM STRIPING

Under the subject of can linings, we cannot by-pass some of the other procedures used in obtaining more complete protection on the interior of cans. **Striping of the side seams is performed in the process of manufacture, whereby the seam is actually sprayed with an additional layer of coating after soldering.**

As previously explained, most can linings are applied to the flat sheets and baked in continuous ovens. They are subsequently slit into individual sizes and subjected to bending, drawing, and forming in the manufacturing process. The area of the side seam is subjected to these operations, and, in addition, receives the heat of the soldering operation.

Gives Added Protection

The enamel in this area may show some microscopic fractures which would be of no concern for packaging a large number of food and nonfood products. However, products such as beer, carbonated beverages, liquid detergents, and some others would be affected by, or would affect, the metal at this point of exposure. **Thus, the striping gives added protection at one of the weak areas of the coating.**

The materials used can be epon esters, modied vinyl, or catalyzed epons to assure curing and flavor-free properties. In beer cans, side-seam striping is accomplished with vinyl material which is then par-

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Package Data for A & P Muffin Tray:

Produced by Berles Carton Co., Paterson, N. J. on four color offset press after wax laminating with greaseproof paper and sheeting. .016 Crossett Bleached Board was selected for its levelness after laminating, fidelity of color in process printing and freedom from mottle in solid areas

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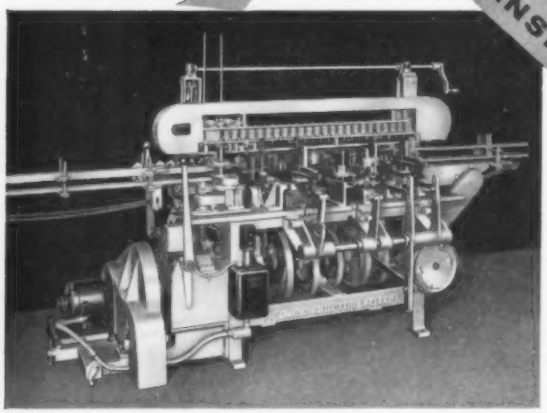
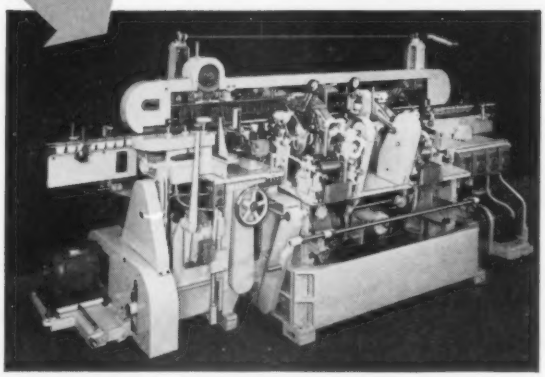
DIREC-TRANSFER

Portable bench type labeler for convenient application to wide range of shapes in glass, boxes, cartons, books and other objects. Offers full-surface gluing for high quality results. Changing from one job to another is a simple procedure, taking a maximum of five minutes.

Basically a semi-automatic unit, this model is easily made automatic by the use of available auxiliary attachments. Designed by Jagenberg of Dusseldorf, this precision built labeler is sold exclusively in the United States by Pneumatic.



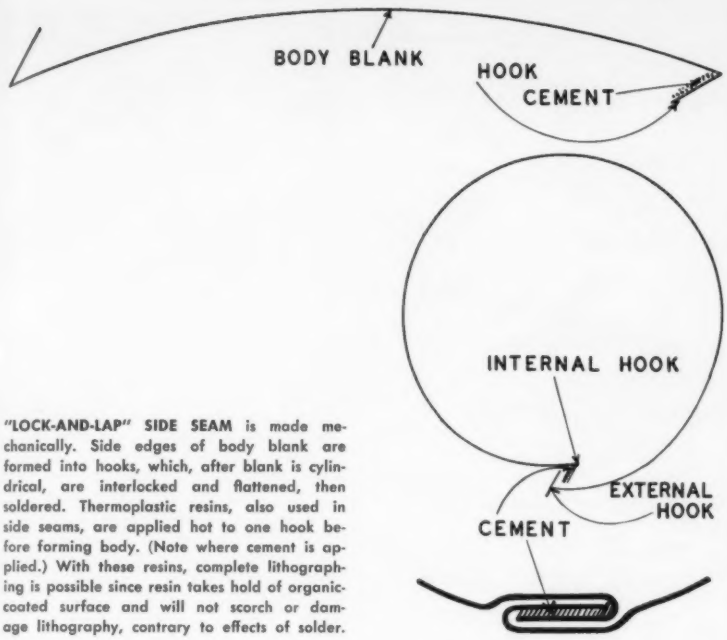
This 4" Simplex unit is one of several models offered by Pneumatic as standard labeling equipment for over thirty years. Using 'glue on bottle' method for label pick-off, the McDonald Labeler has proved its efficiency in literally hundreds of installations. All models are well equipped with safety devices to prevent loss of production time and materials. Round, oval or rectangular shapes may be run with front only or both front and back labels being applied simultaneously.



Duplex in action, this Labeler handles two containers at a time for front only or both front and back application. A three-station indexing turret with suction pads picks labels off bottom of label stack as turret revolves in counter-clockwise direction. Each label receives thin, uniform coating of adhesive from roller and is given time to "temper" as it travels to next station. At final position of turret, the label is transferred directly, through contact, to bottle. Continuous straight-through intake provides gentle handling of glassware, and bottles are in positive control throughout labeling process. Equipment includes "no bottle, no label" and "no label, no glue" safeties.

PNEUMATIC SCALE CORPORATION, LTD., 77 Newport Avenue, Quincy 71, Mass. *Sales Offices: New York; Chicago; Dallas; Rochester. Agents: Fred Todt Company, Los Angeles, San Francisco and Seattle; Rockwell Pneumatic Scale Ltd., London N. W. 2, England; O. R. M. A. Paris, France. Subsidiaries: Delamere & Williams Co., Ltd., Toronto; Carbert Manufacturing Co., Inc., Cambridge, Mass.*

★PNEUMATIC *Packaging and Bottling Equipment*



"LOCK-AND-LAP" SIDE SEAM is made mechanically. Side edges of body blank are formed into hooks, which, after blank is cylindrical, are interlocked and flattened, then soldered. Thermoplastic resins, also used in side seams, are applied hot to one hook before forming body. (Note where cement is applied.) With these resins, complete lithographing is possible since resin takes hold of organic-coated surface and will not scorch or damage lithography, contrary to effects of solder.

tially set by the residual heat of the side seam, since the striping occurs seconds after soldering. This, however, is followed by a complete internal vinyl spray and both are then subjected to a baking cycle in an oven specially designed to handle can bodies.

Generally, it is necessary to provide greater protection to the enamel on the ends of the can for such products as beer and carbonated beverages. This may be accomplished by applying an extra layer of wax on the curved portion of the end, just above the depressed portion (channel) which fits over the flanged edge of the can body. A measure of protection also may be accomplished by an especially highly resilient compound placed even higher on the sidewall of the gutter.

THE BASE BOX

Enamel and lacquer mileage figures are usually interpreted in gal./base box, or, base boxes/gal. A base box consists of 112 sheets of plate, each 14x20 in. This is equivalent to an area of 31,360 sq. in. (one side).

Since mileage is controlled by the weight of dry film required after baking and the weight of dry solids in each gallon of original or

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Circle No. 244 on Card, Page 83

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formulated wet coating material, these must be known before mileage can be calculated. The weight of dry solids/gal. obviously may be computed from the per cent of the solids times the total weight/gal.

The formula for base boxes/gal. (B.B./gal.), therefore, is:

$$\frac{\text{Wgt./gal.} \times \%\ \text{solids}^{*} \times 453.6}{31{,}360 \times \text{film wgt.}^{\dagger}} = \text{B.B./gal.}$$

BASE STEEL

The process of manufacturing a can actually begins with the chemistry of the base steel at the tin mill. **The three types of base steel supplied are:**

Type "L"—Low metalloid steel for highly corrosive products (Class I), such as fruits and acid fruit products.

Type "MR"—Similar in metalloid content to Type "L," but less restricted in residuals; for mildly corrosive (Class II) products.

Type "MC"—Rephosphorized or Bessemer steel to give higher temper; for mildly or noncorrosive food products (Class III).

Some of the products in these classes are:

Class I—highly corrosive food products such as berries, prunes, cherries, pickles, sauerkraut, prune juice, plums, spiced fruits, jams, jellies, preserves.

Class II—mildly corrosive products such as tomatoes, peaches, pears, apple sauce, pineapple, grapefruit, nectars.

Class III—relatively noncorrosive products such as peas, corn, and stringbeans, which do not require limitations of composition of steel.

In Seven Different Tempers

These basic steels are offered in seven different tempers. Each type is not offered over the entire range of tempers due to the fact that temper is affected by both steel composition and the degree of final temper rolling.

Within this group of base steels and tempers we are offered a range of weights and thicknesses, the most common of which weigh from 75 lb. (0.0083-in. thickness) to 112 lb. (0.0123-in. thickness) per base box, in increments of approximately 0.0005-in. thickness.

These variables are supplied in the following categories:

1. Plain uncoated sheets (black plate)—These require a protective organic coating before they may be used for containers.

2. Hot dipped tin plate—The tin coating is applied by dipping the sheets into molten tin.

3. Electrolytic tin plate—The tin coating is applied by electrolytic deposition in any of several different thicknesses on each side.

4. Terneplate—A tin-lead alloy applied by hot-dip methods.

5. Chemically treated plate—The plain uncoated sheets are given a chemical treatment so that inorganic surface film remains for better corrosion resistance and paint adhesion.

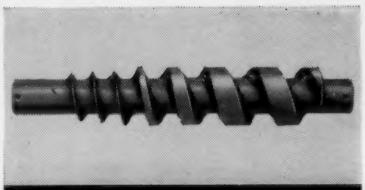
SIDE SEAMS

There are several different physical designs and sealing methods used by the can industry for the side seam. For the ordinary fruit, vegetable, and meat cans that require heat sterilization, the lock-and-lap seam sealed with solder is the most common.

With Solder

In can manufacturing this is performed by mechanical means in a body maker and side seamer. The

*Solids expressed as decimal.
†Gm./sq. in.



New
INFEED TIMING SCREWS INCREASE PRODUCTION LINE SPEEDS

Even unstable containers can now be fed with smoother acceleration using the new Kinsley Timing Screw. These screws are generated to fit each specific application. Feed practically any type containers at as much as 30% higher speed without shock and discharge them at required spacing. Used on fillers, cappers, labelers, washers, etc. Made of non-marking, tough Formica. Ask to see our representative.

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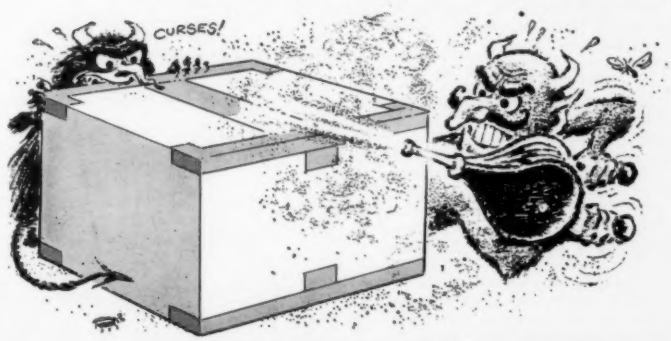

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U.S.I. POLYETHYLENE NEWS

A series for plastics and packaging executives by the makers of PETROTHENE® polyethylene resins

DECEMBER, 1959 — U. S. Industrial Chemicals Co., Division of National Distillers and Chemical Corporation — 99 Park Ave., N. Y. 16, N. Y.

Packaging Notes

A handy polyethylene pump for inflatable items has been marketed by a California manufacturer of air matresses and beach toys.

The pump consists of an open polyethylene bag with a reinforced hole at one lower corner. The polyethylene pump is used by attaching it to the valve of the inflatable item, and fluffing the bag open. Then the top is closed by rolling it. Finally, the bag is squeezed down and rolled to force the air from it into the inflatable item.

Compact First Aid Kits of Polyethylene are being marketed. The inexpensive kits are specially designed for marine use, but outlast metal containers any place where corrosion is a problem. The kits are water, rust, and mildew proof. They also float. The kits are available in two sizes and contain bandages, tapes, ointments, and scissors normally found in first aid kits.

Wholesale jewelers use polyethylene bags to ship their merchandise. The tough polyethylene bags not only give better inspection advantages but they also eliminate heavy returns of jewelry formerly scratched in shipping.

Use of a heat-sealed strip of polyethylene has greatly reduced the difficulty of opening sealed polyethylene bags. This application of polyethylene is now being used by a cake mix producer for easy opening of his package's inner bag.

A ½ inch strip of polyethylene is welded along the width of one side of the bag by a thin line of heat-sealing. It runs 1 inch below the top of the bag and extends ¼ inch from each edge of the bag. When the free end of the strip is pulled, the polyethylene bag tears with it along the heat-seal line.

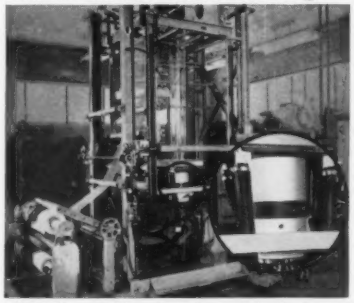
DO YOU HAVE a new polyethylene packaging development you'd like the industry to know about? Make it routine to send your information on new developments to U.S.I. POLYETHYLENE NEWS.

Address the Editor,
U.S.I. POLYETHYLENE NEWS, U. S. Industrial Chemicals Co., Division of National Distillers and Chemical Corp., 99 Park Avenue, New York 16, N.Y.

New U.S.I. Technique Improves Optical Properties of Blown Polyethylene Tubing

Annealing Chamber Increases Light Transmittance, Reduces Haze

The U.S.I. Polymer Service Laboratory has developed an annealing chamber or "chimney" technique which results in significant improvement in clarity and gloss of blown polyethylene tubing, with practically no sacrifice of physical strength. The method, involves installation of a chamber which encloses the blown tubing between extruder die and air ring.



Polyethylene tubing has improved clarity and gloss when produced with new U.S.I. annealing chamber technique. Close-up view shows "chimney" in place between extruder and air ring.

Unit is easy to install

The chimney may be made of wood, glass or insulated metal. It should be constructed in two sections or hinged to permit installation during extrusion . . . thus eliminating need for rupturing the "bubble" when threading film through the annealing chamber.

Height of chimney is an important factor. Optimum results are usually obtained with a 6 to 10" chimney height. While ratio of chimney diameter to die diameter is not critical, it should be held between 2:1 and 3:1. For example: a 3" die would require a 6 to 9" chimney diameter.

An evaluation of PETROTHENE P-200-25 resin using this technique revealed:

Optical Property	*No Chimney*	*8" Chimney*
Transmittance	30%	70%
Gloss	7%	11%
Haze	11%	4%

No significant change was noted in impact strength. Elmendorf tear tests showed that a directional strength balance was brought about by adding the chimney. Tear values increased in the transverse direction and decreased in the machine direction. Yield, break and elongation were essentially unchanged.

Work on this new technique is continuing at the U.S.I. Polymer Service Laboratory, where your inquiries are always welcomed. If you have special problems, U.S.I. engineers will gladly offer their assistance. You are also invited to write for a Technical Data Sheet describing the new process.

Polyethylene "Socks" Used in Causeway Construction

A causeway between Miami and Miami Beach will consist of a number of bridges connecting a series of man-made bulkheaded sand islands. The company building the causeway has found a unique construction use for polyethylene film "socks."

When the sheetpiles that form the bulkheads for the man-made islands are in place, the top pockets or slots between adjacent piles are grouted with mortar to make the wall absolutely tight and prevent loss of sand fill. To prevent leakage of mortar in this operation and to save time in building forms, the contractor devised polyethylene "socks" that fit in the slots to be filled.

A small amount of mortar is placed in the bottom of the "sock." The sock or bag is then allowed to sink into place in the slot and the rest of the mortar is then poured into it. The method is described as an efficient and effective way to seal joints in precast concrete structures, whether in water or in the dry.

Polyethylene is Vacuum Formed on Planting Pots

A midwest company has developed a process for vacuum forming 1 mil polyethylene film around peat moss planting pots.

The pots, which are used to start flowers, vegetables and nursery stock of all types, shorten the plants' growing period, and at the same time, improve their quality.

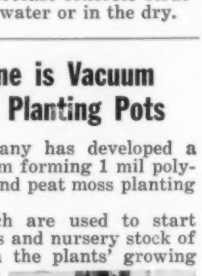


Photo courtesy A. O. Reynolds Co., Lebanon, Indiana

This vacuum forming of polyethylene has significantly improved the pots' strength by increasing their resistance to water damage. The polyethylene jacket insures a constant supply of water for the plant in the pot. When the plant and its pot are ready to be put in the ground, the polyethylene film strips off easily.

These pots, now being field tested extensively by greenhouses and commercial growers, are molded by drying peat moss paper slurry. The polyethylene film is then vacuum-mated to them.

side edges of the body blank are formed into hooks, or turned edges, one up and one down, which, as the body blank is formed into a cylindrical shape, are interlocked and flattened. Soldering is accomplished by the seam's passing along, and coming in contact with, a revolving longitudinal roll partially submerged in a bath of molten solder.

Certain innovations such as small incisions, cut-outs, or tabs are formed in the side seam to **increase the area of solder flow and contact. This is to strengthen it so that products which produce high pressures can be packed successfully.** As an example, **when beer is pasteurized after being sealed in the can, the pressure inside, depending on carbonation, will range from 60 to 90 lb./sq. in. The pressure inside carbonated beverage cans will go as high as 90 to 100 lb./sq. in. at storage temperatures of 100 to 110°F., which are not uncommon during the summer months.**

With Thermoplastic Resins

Thermoplastic resins also are used in sealing side seams. In this operation a melted resin is applied hot to one of the body hooks before the forming operation. Complete lithographing is thus possible because the resin will take hold of the organic-coated surface and will not scorch or damage the lithographing. These are contrary to the effects of solder. **The type of thermoplastic resin used is dependent upon the requirements of product resistance. The same resin used for anti-freeze would not be used for motor oil, for instance.**

Cans with thermoplastic side seams are used for frozen juices, anti-freeze, detergents, motor oil, liquid waxes, cleaners, and many others.

END SEAMS

The seams on the tops and bottoms of a can (termed "double seams") are just as important as the side seams. Both ends are stamped with stiffening profile rings of various designs so that the lightest metal can be used. **In the case of beer and soda beverage cans, the ends are made of relatively heavy metal of a high stiffness, with a special profile to withstand the high pressures developed by these products.**

Use "Gasket"

In sanitary cans the double seam, or end seal, is obtained through the use of a water-base or solvent-base rubber composition applied as a gasket in the crevice around the periphery of the end piece. **Water-base compounds are better for certain uses. However, solvent-base compounds must be used for tops where the containers are subjected to high filling temperatures and/or steam, since under such conditions the water-base materials have a tendency to migrate during the double seaming.**

For most general line containers, a water-base material may be employed, but the type depends on the product to be packaged and the degree of resistance required. *(End)*

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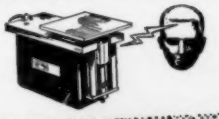

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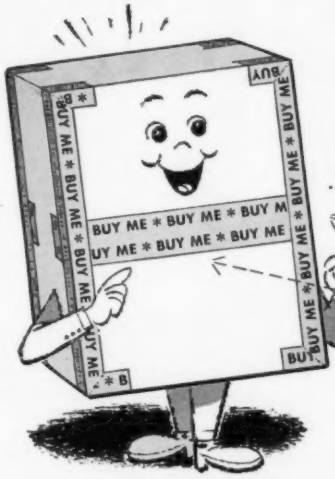

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Announcements of machinery and products

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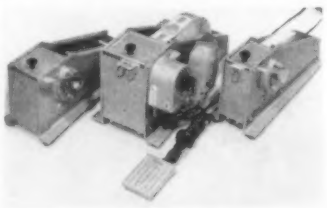
2. Now, *circle* the corresponding numbers on the postcard, Page 83.
3. Next, *fill* in your name and address.
4. Then, *mail* the card — we pay the postage.

Label Dispensers

Derby Sealers, Inc. announces three new "Grip-A-Tab" dispensers for pressure-sensitive labels



featuring new feed and rewind mechanism. The L series includes two lever-operated models, LH-10 for labels up to 1 in. wide (maximum web width 1¼ in.) and LH-20 for labels up to 2 in. wide (maximum web width 2¼ in.), and electrically-operated model L-30 for labels up to 3 in. wide (maximum web width 3¼ in.) which has a rheostat speed control that delivers up to 15 ft. of stock/min. Circle No. 1.

Folding Box

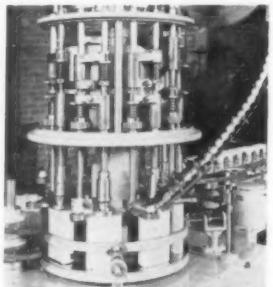
Mead Packaging, Inc., Atlanta Paper Company Div., introduces its new folding box, "Stack-Pak." Designed especially for top-to-bottom stacking, box has one-piece construction and a flip-type, double-wall post in the four corners of the bottom. "Stack-Pak" has withstood direct pressure of 340 lb. without crushing, Mead says. Once fully opened, box automatically locks into that position and requires no pulling or folding into shape. Manufactured from Mead virgin, natural or bleached kraft board, it is available with a minimum depth of 2½ in. and a maximum depth of 5½ in. Circle No. 2.

Flexographic Printer

Industrial Marking Equipment Co., Inc. has developed a new package and product marking unit, "Flexo-Printer," which prints on multiwall bags or knocked-down cartons, handling both top and bottom simultaneously. Production speeds range up to 35/min. with 36 x 48-in. cartons. A magazine feeding system has a capacity of 150 cartons at a time. In the inking system, a rubber roll runs constantly in a bath of ink, then comes in contact with an engraved steel metering roll, hard chrome plated and polished for extra long life, even at high speeds. This metering roll in turn applies ink film to rubber type on a roller made of cured and ground rubber. Circle No. 3.

Capper For F-Style Containers

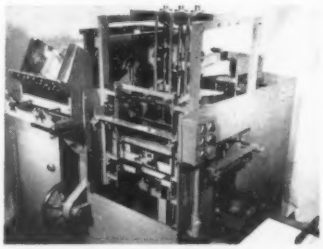
Consolidated Packaging Machinery Corp. announces a new capper for inserting plastic captive closures



in F-style containers. Multi-spindle, continuous-motion, rotary-type machine hopper feeds the closures, which are picked out by a moving cap arm which then swings back, centering the cap under the chuck. This chuck then turns these closures so the hinge strap and lifting tab bear against vertical stops and the chuck then descends, picking them up and inserting them into the can through a clearance opening in the cap arm. The cap arm also drops onto the can, holding it centered under the chuck for the closing operation. Chucks can be adjusted to have the captive cap and strap lengthwise on the can. Unit will handle 250 qt. cans/min. Circle No. 4.

Package Forming Machine

R. A. Jones & Co., Inc. announces the development of an automatic machine to form sheet plastic



into packages without the application of heat or adhesives. Using the "Plasti-Lok" process, the machine cold-folds and locks unscored die-cut plastic blanks into trays at speeds of 40 to 100/min., depending on package size. Basis of new system is cold-folding principle, which eliminates heating and forming of plastic sheets. Essentially, principle is a means of confining material to prevent cracking or crazing while it is being folded and permitting it to resume its stability after package is locked. Circle No. 5.

Table Top Chain Conveyor

Conveyor Specialty Co., Inc. announces its chain conveyor to carry bottles, cans, jars, small parts and packages. Unit can be used with separate filling or capping devices or integrated with other machines to form a complete system. Turntables can be supplied at transfer points as required. Chains are available in case hardened plain steel or stainless steel and in 3¼, 4, 4½, 6 and 7½ in. widths. Circle No. 6.

Heat Seal Coating

Gordon Lacey Chemical Products Co. announces its H 197 W vinyl type of heat-seal coating which provides heat seal and chemical resistance properties to aluminum foil and paper. It can be sealed

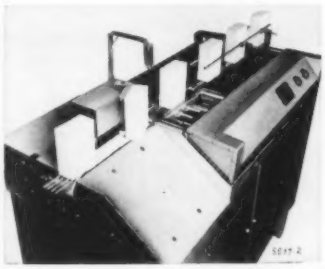
coated side to coated side or coated side to uncoated side—also to vinyl and saran film as well as to cloth or moisture-proof cellophane. Its appearance is of almost a water white film. It seals in 1½ to 3 sec. at 325° to 375°F., weighs 7.6 lb./gal., has a blocking temperature face to face of 1 lb./sq. in. at 125°F., and 30 per cent solids. Circle No. 7.

Flexible Packaging Material

H. P. Smith Paper Co. announces the availability of metallic polycel, a cellophane - polyfoil - poly combination. The cellophane can be reverse printed with transparent inks and opaque inks can also be used. Circle No. 8.

Checkweigher For Two-Way Segregation

Food Machinery and Chemical Corp., Packaging Machinery Div., introduces its development of a



two-way segregation checkweigher which checkweighs sealed containers at speeds up to 350/min. Weighing is done "on the fly" and scale is preloaded for maximum accuracy at high speeds. These individual tension adjustments set the scale for each package size to detect variances of as little as ¼ per cent of the total weight, FMC says. As container moves from scale, electronic system instantaneously classifies it and signals reject mechanism. Packages with unacceptable weights are diverted down a chute out of production line by solenoid-operated arm. Electronic system is mounted on single plug-in chassis and housed in a slide-out drawer for easy maintenance. Model handles semirigid containers with one flat surface ranging in size from 1½ x 1½ in. to 10 x 10 in. Circle No. 9.

Form-Fill-Seal Machine

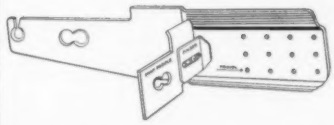
Package Machinery Co. has introduced its "Transwrap" model S-750 automatic bag forming, filling and sealing machine which forms bags from 3 to 15 in. long and 2 to 8½ in. wide, at maximum rate of 75/min. Screw adjustment determines bag length, and hand wheel regulates speed. Unit runs polyethylene film and all other flexible, heat-sealing materials, and is available with three methods of feeding—net weight, auger, or volumetric. Features include centralized electrical controls and a push-button control station. Sealed ball and roller bearings in central drive eliminate lubrication and avoid possible product contamination. Machine is 7 ft. high and requires floor space of 5 x 4 ft. Circle No. 10.

Box Opening Unit

Emhart Manufacturing Co.'s Portland Div. announces a portable unit that automatically opens corrugated cases at rates up to 30/min. Called the "Auto-Box," it can be used with any horizontal or vertical type Standard-Knapp packer, with either mechanical or automatic feed. Unit takes each case from stack of flats, opens it, tucks in end and side flaps on one end of case and discharges case. Side flaps are folded back deeply, a feature that creases the scoreline and causes case to ride flat on its bottom edges on conveyor. Machine is available in nonadjustable and adjustable models, the adjustable handling cases from 20 to 30 in. long, 12 to 24 in. wide (measure in flat) and from 4 in. upwards deep. Circle No. 11.

Bread Wrapping Device

Crown Zellerbach Corp.'s Western-Waxide Div. announces the development of a unique device to



eliminate drag on AMF type wrapping machines: its Crown-Seal finger and tucker assembly. Unit has "fingers" which extend and carry bread through wrapping machine, securely holding end of load as it is pushed through folders to end sealers. Crown Zellerbach says "hand carry" feature frees bakers from problem of varying slip properties of wrappings and allows wrapping as tightly as desired with both polyethylene film and cellophane. Assembly consists of fingers, tuckers and snap paddles. Circle No. 12.

Parts Counter

Atronic Products, Inc. announces a new automatic parts counter; model 605 counts specific quanti-

ONLY WITH GUMMED TAPE...

* a dust, dirt, vermin-proof closure
* cartons that open easily, are re-usable
* a means of selling while you seal

PLUS—LOW COST!

a minimum investment in equipment—simple, economical to operate and maintain—does not require skilled labor.

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For more information circle No. 252 on Reader Service Card, Page 83

RONDO *"the pack with the built-in shock absorber"*

HOLDS and PROTECTS SMALL, DELICATE OBJECTS While Handled in Production, Shipment and Storage

THE UNIQUE FEATURES PROVIDE:

Full advantage of the Rondo features is achieved when the Rondo tray itself is introduced early at the proper place in the production line. Here objects are inserted in the partitioned flutings and are then conveyed in the same unit through the various stages of control, storage, shipment and point-of-sale display.

Objects readily "snap" into the Rondo spring-clip flutes and are held firmly even if turned upside down! The predetermined number of items held by one Rondo tray makes possible a swift, accurate count at any time during the operation. Inspection is fast and efficient because the product is completely visible, which is not existent with other types of partitions where objects are loosely held in an upright position.

Objects are stored in the same Rondo tray even in open stacking to assure quick count for checking or inventory. These filled Rondo trays are then directly packed in cartons for bulk shipping, or slipped into folding boxes for dispatching small units.

In shipment, the shock-absorbing features are fully realized. Each object is actually suspended in a cushion of air and separated from the others by the same means. No padding is needed because Rondo itself virtually eliminates breakage from impact.

Upon arrival, each object is easily accessible, no time is lost in unwrapping or untangling. The filled Rondo tray may be combined with a decorative folding box, cellophane cover, or without reloading, it can be inserted directly in a point-of-sale display.

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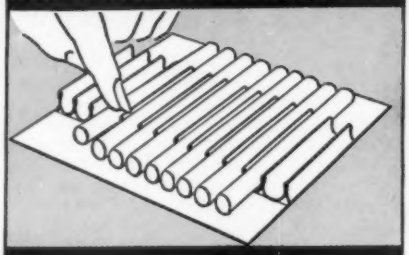
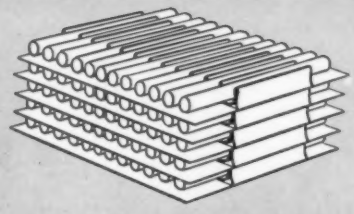
RONDO is successful with: medical ampuls, hypodermic needles and syringes, electronic tubes and components, pen and pen parts, artists' colors and pastels, watches and counting mechanisms, tools, and many others.

Consult us about your possible application of the Rondo method. Present facilities will accommodate objects from 8 to 26mm in diameter. Tooling for larger sizes possible.

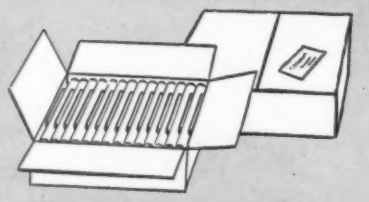
FAST HANDLING IN PRODUCTION



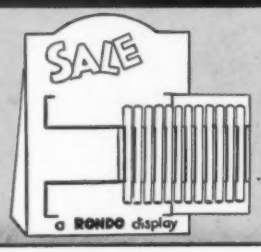
EASY STACKING AND STORAGE



SAFE RIDE IN SHIPMENT



ECONOMICAL USE IN DISPLAY



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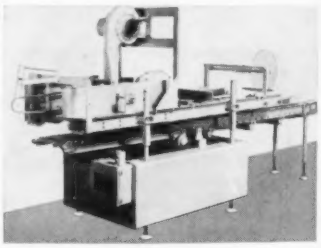
ties for packaging into preselected group sizes. Parts may be batch loaded directly into the model 605 or fed into the hopper by an auxiliary conveyor. Especially designed to count odd-shaped items and parts which might interlock, unit handles parts from ⅛ to 4 in. and from 1/20 oz. to 1 lb./part. This fully transistorized electronic unit is capable of counting up to 20 pieces/sec., depending on size. Circle No. 13.

Four-Flap Case Opener

Atkron, Inc. has improved its "Atkron Dumore" automatic four-flap case opener. Model CFO-2 is de-



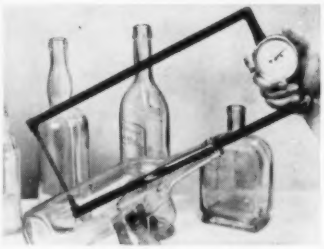
signed to open all four flaps of cases, adjusting to handle cases from 9 in. wide and 4 in. high to 14 in. wide and 11¾ in. high—at rates up to 30 or more cases/min. Cases enter flap opener between pressure rollers which compress the sides of case just enough to raise side flaps so flap plow may enter and turn flaps back to horizontal position. Opened side flaps are grasped between rubber carrier wheels and carrier V-belts which propel case through remainder of opening operations. Grasped by carrier belts, case then moves under a blower which lifts front flap to engage the lagged opener belt. Opener belt, spring loaded and moving still faster than carrier belts, then draws front flap open with a smooth pole-vaulting action. Rear flap then passes beneath blower, which raises rear flap to engage opener bar which draws rear flap open as case moves forward. Circle No. 14.

Wax-Lined Bag With Window

Moser Bag and Paper Co. announces its "Pre-Vue" bag, a wax-lined, square-type paper bag with pinch-bottom and a full-length "window" which is coated with Moser's "Hevi-Cote" wax lining process. Window is a permanently attached 3-in. wide section of clear polyethylene extending from end-to-end through the center of the front panel. Front panel on both sides of window is printable, as is the entire back panel. Circle No. 15.

Wall Thickness Measure

Testing Machines Inc. announces the availability of a new apparatus for measuring the wall thick-



ness of hollow containers with narrow necks, especially glass bottles. One of its measuring "legs" can be telescoped, permitting it to be introduced through narrow bottle necks and similar small openings. Apparatus can make measurements at distance of 12¾ in. from mouth, and can be introduced through openings down to ½ in. Metric graduations are also available. Circle No. 16.

Capsule Printer

Markem Machine Co. has developed a capsule printer for offset marking that places an imprint

on one or both ends of No. 0, 1, 2, 3, 4 or 5 hard 2-piece gelatin capsules, empty or filled. Short runs on model 131A are made practical by easy, quick replacement of the printing wheel for a change of imprint, and quick removal of ink reservoir for color change or clean-up, Markem says. Variable speed rotary feed unit picks up capsules from loading hopper and feeds them into a chute leading to the printing head. A photoelectric device monitors the chute feed and automatically shuts off power to the printing head if there are no capsules in the printing position. Each cap-

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OVER-RUNNING, INDEXING
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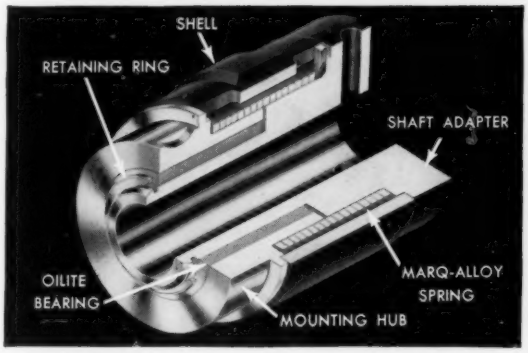
CLUTCHES



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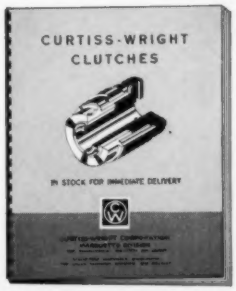

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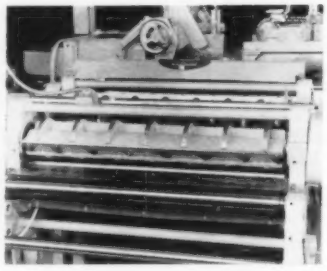
sule is fed into register and offset-marked with an imprint or imprints and is then ejected automatically. Circle No. 17.

Inker For Case Sealer

J. L. Ferguson Co. announces that a disposable inker employing "Porelon" resin is being included on



new "Packomatic" imprinting equipment and for replacement of the felt inkers on existing machines. Porelon is a porous, resinous material with printing ink added during formulation. This compound of Porelon and ink plus capillary-action keeps a metered ink-availability on its surface at all times. Type is never flooded and there is no "pick-up" of fibreboard lint, felt hairs, and so on. Circle No. 18.

Good news for users of tape

Here's the latest idea in sealing cartons... the DIAL-TAPER. You dial the length of tape and the DIAL-TAPER does the rest automatically ... measures tape accurately, moistens tape with warm water and cuts off clean.

Users report "up to 50% saving in TIME, 25% saving in TAPE, plus stronger, neater package. Tape sticks tight with one pass of the hands." Used by U. S. Government, Ford, General Electric, all types of business.

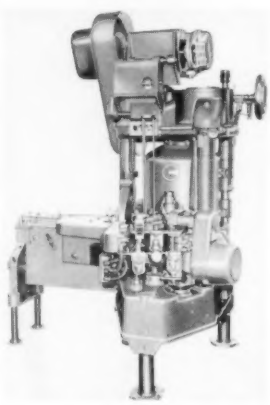
For free booklet DT-5 write to Marsh Stencil Machine Company, Belleville 34-A, Illinois. T-23

Skin Packaging Unit

Skin-Pak Machinery Co., Inc. introduces its model F Skin-Pak machine, a fully automated skin packaging machine. With a bed size of 22x34 in., unit accommodates film width of 25½ in. with drape of 5 to 8 in. Six motions cover all manual operations; heating cycle and vacuum time require a maximum of 15 sec. for a complete skin package board, 22x34 in. Each board can then be cut to produce multiples of individual packages. For blister or bubble packaging, both male and female molds can be used for fully automated, fast packaging cycle. A new "Equi-Thermo" heater delivers uniform heat throughout film area because of woven-wire construction. Circle No. 19.

Can Closing Machine

Continental Can Co. introduces its 450-HCM can closing machine to emboss and close 1-qt. oil



and anti-freeze cans at a maximum speed of 600 cans/min. Equipment included consists of a motor bracket, heavy-duty marker, basic filler drive, explosion-proof electrical attachments, universal floorstand, 90° discharge with idler sprocket and atmospheric change parts for the 401 x 509 size can. Machine's seaming mechanism and cover feed can be adjusted to handle aluminum cans. Circle No. 20.

Plastic Stabilizer

Guardian Chemical Corp. announces its "Voidox 100%" as a stabilizer for polyolefin plastics and polyvinyl types. Percentages ranging from ½ to 1 percent caused increases in both the light and oxidation resistance on the part of these plastics and, simultaneously, improved their flexibility in heavy sections, Guardian says. "Voidox 100%" is a white, waxy, fatty-acid modified derivative of a substituted phenol, and it can be employed as a modifier of plastics which are to be used for manufacture of food containers. Circle No. 21.

Carton Opening Unit

Gardner Div., Diamond National Corp. has developed a new carton opening machine that will set up

any 6- to 16-oz. carrier, at a rate of up to 40 carriers/min. The "Cartoneer" is a portable unit equipped with casters, and works automatically or "on demand." In operation, carrier flats are fed into hopper which holds up to 170 carriers. The operator loads hopper from front—he can load and remove set-up carriers from the same spot. Set-up carriers are discharged with handles to front permitting operator to work from either side of machine. Circle No. 22.

Heat-Sealable Parchment

Paterson Parchment Paper Co. introduces its heat-seal "Patapar" vegetable parchment for packaging applications involving high wet strength, grease resistance, or direct wrapper contact with products of high oil content. The paper offers protection against water vapor transmission, can be heat-sealed face to face or face to back, and, Paterson says, it will function smoothly and efficiently on conventional automatic heat-seal wrapping equipment. Circle No. 23.

Film Perforator

Battle Creek Packaging Machines, Inc. announces the availability of new optional equipment—a film perforator to facilitate opening of packages—for its wrapping machines using plastic films. Battle Creek developed the perforation concept for plastic films for manufacturers who use polyethylene or other plastic films to overwrap nonperishable products. Attach-

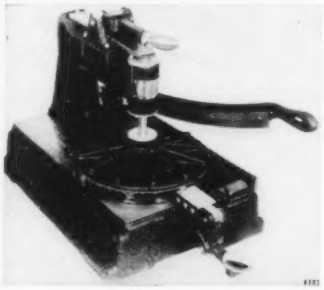
ment can be set to function with an electric eye to register perforation line almost anywhere desired on package. Circle No. 24.

Packaging Film

B. F. Goodrich Industrial Products Co. has developed a new film, a rubbery material derived from Estane VC, a development in polyurethanes. When used as a special purpose packaging material, containers made of new film would be impervious to air or gases, would withstand constant exposure to oils and many other chemicals, Goodyear says. Film remains flexible at sub-zero temperatures with satisfactory low temperature service anticipated at minus 40°F. Aging has little or no affect on the film, and it withstands exposure to nuclear radiation. Circle No. 25.

Sample Sheet Cutter

Thwing-Albert Instrument Co. announces the development of a four-square sample cutter for pre-



paring accurate 1-sq. ft. samples for precision weighing of paper, plastic, and other sheet material. Indexing for four 90° movements assures preparation of accurate samples in seconds, Thwing-Albert says. Heavy paperboard can be cut easily due to the progressive cam action which insures a point to point contact of the blades throughout entire cutting stroke. Circle No. 26.

Aerosol Valve Sealer

PMC Industries announces development of an improved method of applying metal aerosol valves to glass containers. Development is a modification of its model RS-1800 high-speed sealer, a multi-spindle rotary machine for attaching metal seals to pharmaceutical vials. A smooth, wrinkle-free finish is produced, even when operating at speeds in excess of 200/min., PMC says. Companion equipment is available for applying dip tube to valve, and for placing valve assembly onto bottle, prior to sealing. Circle No. 27. (End)

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SINGLE OR MULTI-CHANNEL GUIDES — easily adjusted to accommodate a wide range of sizes. Multi-channel arrangement for high feeding rates.

VIBRATORY FEEDER — feeds the parts to be counted on to a short conveyor belt which carries them through the guides to the batcher.

BATCHER — solenoid operated; pulsed by the preset counter. Automatically divides the counted objects into preset quantities by diverting the flow or accumulating a batch.

HIGH SPEED COUNTER — any of the Post Preset Electronic Counters may be used. Preset counts from 1 to 1,000,000, with counting speeds up to 5,000/second.

DIMENSIONS

Length	53"
Width	12"
Height	18"
Length without Vibrator	34"

Feed . . . count . . . batch . . . *automatically* for far less cost!

THAT'S RIGHT! The labor saving Post FCB-1 will take over your small parts problems! *Feed* them . . . *Count* them and, if you desire, *Batch* them in precounted quantities which can be dropped into individual boxes, bags or other containers fed under the batcher gate.

Accurate? . . . *Absolutely*, and the FCB-1 will handle from 300 to 1,000 pieces per minute. More, this unusual device is compactly designed and *is portable*. You can move it from one line to another in minutes.

Economical? . . . Definitely with far less initial cost than any competitive equipment *and* the FCB-1 repays its own cost in labor savings.

Ideal for small hardware, electronic components, tablets . . . *even* buttons, if counting is highly important. Why not get details by writing and telling us your small parts problem? If you care to do so, we'll be happy to receive a few of your products for FCB evaluation by our engineers.

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POST

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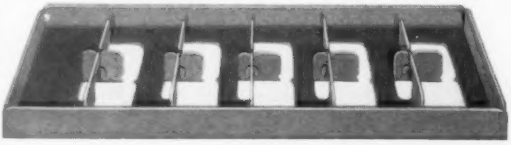

HERE'S WHAT DI-CEL DID FOR A LEADING BAKERY: Reduced handling costs by 20-25%. Reduced package material costs by 12%. Cut spoilage by more than 6%. These are the actual results achieved for a leading Midwest bakery by Di-Cel®, a new packaging system developed by Container Corporation. Provides unique packaging flexibility for a dozen different types of bakery items. In addition, bakery items can't roll or break in transit. Tops are fully exposed, instead of sides, for maximum sales appeal. Di-Cel also available in nested, tapered tray styles.

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Straight Line Filler

The Filler Machine Co., Inc. offers an illustrated data sheet on the Model SL-55 straight line filler, designed to handle semiliquid and semi-solid products such as jellies, mayonnaise, salad dressing, cosmetics, pharmaceuticals, petroleum, and chemical products. Five types of model are available with speed ranges up to 300/min. It is constructed to handle ½- to 32-oz. glass, metal and plastic containers. Features are: air-operated valves that cut off instantaneously regardless of cycle speed, a "no-container, no-fill" device, and stainless steel construction of contact parts and parts around filling zone. Circle No. **101.**

Packaging Adhesives

Arabol Manufacturing Co. has a booklet entitled, "How to buy adhesives for better adhesion," which offers 23 yardsticks for selecting the right adhesives for a particular application. Some factors to be considered: material being used; length of time adhesive must "stick;" conditions such as dry heat, dry cold, moisture with which product may come in contact; how adhesive is to be applied. Circle No. **102.**

Aerosol Crimping Machines

John R. Nalbach Engineering Co., Inc. offers circular No. XIV describing its complete line of aerosol crimpers. Detailed drawings and specifications are included. Circle No. **103.**

Liquid/Semiliquid Fillers

Horix Manufacturing Co. offers a catalog, No. 581-P on its line of fillers for liquid and semiliquid products. A full range of machine sizes and types is given—from hand-operated to fully automatic rotary models. Catalog has sections for gravity and vacuum type fillers. Included are illustrations, production statistics such as speed range, products handled and operational features. Circle No. **104.**

VPI Paper Calculator

Ludlow Papers, Inc. has a booklet with a chart for simplified calculation of VPI paper requirements necessary to protect a given area. VPI papers are coated with a volatile chemical which protects ferrous metal products against rust. Booklet also includes four fundamental rules for properly handling this material. Circle No. **105.**

Packaging Adhesives

Swift & Co. has a booklet outlining its variety of adhesives. Descriptions of packaging applications are given, including top and bottom case sealing, tight wrapping, multiple unit packaging, folding cartons, set-up boxes, glass and can labeling, tube winding, laminating, bag manufacture, and bag closure. Circle No. **106.**

Band-Type Heat Sealer

Ralph Chaffee & Co. has an illustrated brochure describing its "Rotor-Sealer." Used in heat sealing thermoplastic materials through a heated metal band, this machine is available in three models. It features forced water cooling, a thermostat range to 600°F., and operates at speeds up to 315 in./min. Sealing widths available are ⅛, ½ and ¾ in. Circle No. **107.**

Dry Product Packaging Machinery

Frazier and Son has a 6-page illustrated brochure on its complete line of packaging machinery for dry products. Photographs and descriptions of each unit are included: volumetric bench, in-line and rotary fillers, net weighers and elevator-feed conveyors. Circle No. **108.**

Feeders/Feeder-Cleaners

Machinery Service Co. has a 4-page illustrated folder on its feeder-cleaner and bottle-feeder. The cleaner air cleans odd-shaped or conventional containers and feeds them directly to filler. Bottle-feeder features adjustable speed control, easy changeover to different size containers, combination tilt and stationary dump-tray for safe unloading of empties. Circle No. **109.**

Label Imprinter, Cut-Stacker

Oliver Machinery Co. has a brochure on its 806 label imprinter, cut-stacker. Unit imprints roll-fed labels with desired legend, and counts, cuts, and stacks them at rates up to 140 labels/min. Circle No. **110.**

Reducing Labeling Costs

Weber Marking Systems has a booklet, "Reduce carton content and product identification costs as much as 90%." Booklet illustrates and explains method for custom-printing labels and tags. Circle No. **111.**

Automatic Wrapper

Hudson-Sharp Machine Co. has a 4-page folder on its "Campbell" wrapper, an automatic machine handling all types of modern wrap materials, tube forming them around the product. It then simultaneously crimps, cuts, heat or glue seals, folds, and delivers. Machine handles hard, soft, and brittle products of regular or irregular shapes. Unit wraps with or without boars or stiffeners, and can be supplied with code daters, label imprinters, strip opening attachments, and so on. Circle No. **112.**

Resin Adhesives

Morningstar-Paisley, Inc. offers information on its "Solu-Rez" series of low-viscosity, multipurpose polyvinyl acetate resin adhesives. Advantages include suitability on most carton sealing and forming equipment at high production line speeds, bonds on different types of carton surfaces, low viscosity and spreadability, washability of machine parts and reservoirs. Circle No. **113.**

Form, Fill, Seal Machine

Mercury Heat Sealing Equipment Co. has a 4-page bulletin on its form, fill, and seal packaging machine, the "Verti-Pak." It is air-operated and automatic, packaging a variety of products into bags of heat-sealable material. Bag sizes range from 1½ x 2½ in. up to 10 x 18 Circle No. **114.**

Pressure Sensitive Labeler

Avery Adhesive Label Co. has available a specification sheet on its automatic pressure sensitive labeler. Labels are fed from a roll and the machine applies them into a registered position on flat, rounded, or concave surfaces. Standard machine handles labels from ¼ to 2½ in. wide at speeds of 40 to 300/min. Machine may be modified to handle labels up to 6 in. wide. Circle No. **115.**

300/Min. Labeler

New Jersey Machine Corp. has an 8-page illustrated brochure on its "Pony 300" labeler. Machine handles round and Blake bottles and accommodates label sizes from 5½ in. wide x 5 in. high to as small as 1⅛ in. wide x ¾ in. high. Variable speed control provides adjustment for production rates from 120 to 320/min. Illustrations of operating features are included. Circle No. **116.**

Humidity-Resistant Corrugated Boxes

Federal Container Corp. offers a testing kit to prove the water- and humidity-resistant qualities of its "Dri-Bak" corrugated boxes. Suitable for shipping produce, frozen goods and other wet products. Circle No. **117.**

Tablet Counter

The Lakso Co., Inc. has an information sheet describing its "48 Tablet Counter." This machine counts and fills from 45 to 100 bottles of 100's/min. Adjustable for tablet thickness, unit is furnished on portable table and uses floor space measuring 27 x 42 in. Circle No. **118.**

Confectionery Packaging

American Viscose Corp.'s film division offers a guide, "Confectionery packaging recommendations." It recommends Avisco cellophane types for packaging a variety of candy as well as candy-coated chewing gum, nuts and popcorn, and types best suited for direct wraps, for carton or tray wraps and for bags or pillow pouches. Circle No. **135.**

Protective Packaging

Vanant Co., Inc. offers a 4-page illustrated booklet and a sample of its "Sus-Rap," a preformed fibreboard wrap-around packaging material. Many applications are pictured. Circle No. **136.**

Labels

Allen Hollander Co., Inc. offers a 20-page illustrated brochure on its line of labels for many different purposes. Prices and specifications are given. Circle No. **137.**

Vibratory Packers And Jolters

Syntron Co. has available a 4-page catalog on its "pulsating-magnet" vibratory packers and hydraulic jolters for bulk materials. Catalog has descriptions, data and specifications for eight packers and for two jolters and shows applications and installations. Circle No. **138.**

Loader And Unloaders

W. F. and John Barnes offers 4-page illustrated folders on its hydro-magnetic retort basket loader and unloader. Illustrations of installations, specifications and schematic drawings are given for each. Circle No. **139.**

Corrugated Set-Up Machine

Gaylord Container Div., Crown Zellerbach Corp., offers a 4-page illustrated folder on its semiautomatic set-up machine for corrugated boxes. Machine sets up and produces up to 900 boxes/hr. Circle No. **140.**

Polyvinyl Squeeze Tubes

Thatcher Glass Manufacturing Co., Inc., Plastic Container Div., offers a folder on its clear polyvinyl "squeeze-to-use" tubes. Available in sizes from ¼ to 10 oz., tubes are suitable for packaging paint pigment, shampoo, shoe polish, oily products, and many others. Circle No. **141.**

Polyethylene Bags

Chase Bag Co. has available a folder, with samples included, of its "Chaseal" bags, made from "Polytex" polyethylene. These clear plastic bags are used for soft goods, produce, meats, nursery products, small parts and liquids. Some varieties available are: offset lip, bottom gusset, tuck-in top. Circle No. **142.**

Release Paper

Crocker, Burbank Papers, Inc. offers details, specifications and a sample of its "Stick-Not," a release paper with silicone coating. It is available in rolls up to 83 in. wide and in special types for specific requirements. Circle No. **143.**

Automatic Filler

Bartelt Engineering Co. has a descriptive catalog on its high-speed automatic filler. Catalog has information on speed, control, types of materials that can be handled, other specifications, and cut-away drawings. It handles granulars, powders, liquids, and pastes. Circle No. **144.**

Automatic Sheeters

Wilcar Corp. offers a 12-page booklet describing its line of automatic variable sheeters for paper, polyethylene, single-faced corrugated, foil, and cellophane. Machine can be set to cut any four preset sizes from 6 to 96 in. Booklet explains how sheeters work, how they are being used, gives specifications and photographs. Circle No. **145.**

Vibratory Feeders

Eriez Manufacturing Co. has a 6-page bulletin, VB-10-1, describing its line of alternating current light- and medium-duty vibratory feeders. Models available are illustrated, from units for light feeding to those for handling up to 10 tons/hr. Circle No. **146.**

Strippable Plastic Coatings

Bischoff Chemical Corp. offers a bulletin on its "Thermo-Cote" strippable plastic coating for protecting tools and small metal parts. The transparent coating is applied by dipping and is peeled off when parts are needed for use. Circle No. **147.**

Propellant Blending

Union Carbide Chemicals Co. has available a technical article analyzing five methods for blending aerosol propellants. The five blending systems discussed use weigh tank, proportioning pumps, the displacement meter, or radiation equipment, or entail continuous proportioning. Article is illustrated with tables, a photograph, and schematic drawing. Circle No. **148.**

Product Catalog

The Dow Chemical Co. offers its 44-page general catalog, "Products of The Dow Chemical Co." It lists properties and uses of 375 industrial, pharmaceutical, and agricultural chemicals being produced. Sections on oxazolidinones, automotive chemicals, textile fibers, and the company's Dowell division are included. Circle No. **149.**

Polypropylene Film

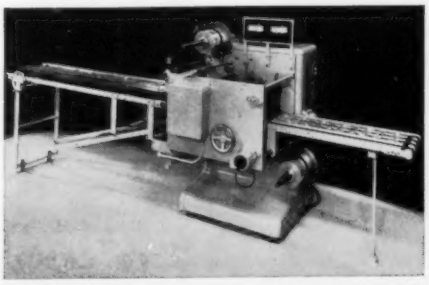
AviSun Corp. offers a preliminary technical data bulletin on its polypropylene film. Characteristics and properties of film are listed. Circle No. **150.**

Label Marker

Soabar Co. has a 4-page illustrated folder describing its model 22 W self-stop label marker. It automatically marks information on a variety of Soabar labels at rate of 144/min., while simultaneously counting, cutting and stacking (or rewinding). Marks with rubber or metal type, slugs, Addressograph plates, numbering registers, and so on. Circle No. **151.**

Protective Packaging

B. F. Goodrich Chemical Co. offers information on "Cipco Foam," an extruded vinyl foam material developed by the Carolina Industrial Plastics Div. of Essex Wire Corp. from Goodrich's Geon vinyl resin. The material is available in profile



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shapes and colors, and in round, continuous lengths in diameters ranging from ⅛ to 1 in., and is suitable for protective packaging. Circle No. **152.**

Electric Temperature Controls

Fenwal, Inc. offers a 4-page bulletin describing and giving specifications for many of its differential expansion "Thermoswitch" controls which cover a range of temperatures. Standard size, midget, miniature, and snap-on switches are included; and electronic, mechanical and thermistor indicating controllers are discussed. Circle No. **153.**

Hot-Melt Adhesives/Applicators

United Shoe Machinery Corp. has available a 16-page brochure describing its "Thermogrip" hot melt adhesives (supplied in rope-like form on coils) and a variety of applicators. Illustrations and schematic diagrams are included, plus specifications, applications and advantages. Circle No. **154.**

Air Cleaning Machines

Pneumatic Scale Corp., Ltd. offers bulletin No. 141, illustrating and describing four machines—2-head unit, automatic inverted air cleaner, "Rota Cleaner," and the "Pneumaclean." For each unit, bottle size limits, operating features, and speeds are given; and floor plans and layout possibilities for the "Pneumaclean" are discussed. Circle No. **155.**

Padded Shipping Bags

Jiffy Manufacturing Co. has three case histories of how and why Jiffy padded shipping bags are used—interior pack for testing devices, shipping bag for hard cover books, and shipping bag for do-it-yourself kits. Circle No. **156.**

Electronic Welding Equipment

Thermatron offers information on its equipment for the electronic welding of window, blister and vacuum formed packaging. It offers tamper-proof, dust-free welds suitable for cosmetic and drug industries, as well as for packaging of small parts. Circle No. **157.**

Liquid Filler Catalog

U. S. Bottlers Machinery Co. has a 16-page catalog, #070158, which describes its line of rotary vacuum fillers. There are six basic models and 14 adaptions covering a range of speeds and container sizes. They handle products varying from free-flowing liquids to syrupy substances, and from oils to waxes. Circle No. **158.**

Waxed Paper And Glassine Samples

Thilmany Pulp & Paper Co. has a sample booklet of nine different papers that are representative of the grades it produces: white and natural dry waxed kraft, cereal liners, bleached greaseproof, and so on. Circle No. **159.**

Protective Paper Samples

Mosinee Paper Mills is offering a data file containing samples and test data on papers such as laminating and coating papers suitable for end uses as release papers or greaseproof barriers, moisture-resistant papers, flame-resistant papers, "Scrimtex," mold-resistant paper, and chemically inert paper for use in contact with metal. Circle No. **160.**

Plastic Drum Liners, Bags/Covers

Protective Lining Corp. has a 16-page illustrated bulletin offering information on the uses, types, and handling of its plastic drum and carton liners. Brochure includes charts indicating where liners may be used, what sizes to use, and various films adaptable as liners. Circle No. **161.**

Paper And Paperboard Coatings

Minnesota Mining & Manufacturing Co. has a brochure, Y-1PB(89.15)K, on its "Scotchgard" brand grease and oil repellant. It discusses and illustrates problems of bleed in asphalt laminates, loss of opacity and color in wax-coated paper and board, cutting costs of polyethylene-coated papers, stopping oil and water penetration in corrugated boxes and oil and grease wicking in envelopes and multiwall bags. Circle No. **162.**

Semiautomatic Meat Packaging

Great Lakes Stamp & Manufacturing Co. has a 4-page folder discussing its system for wrapping, sealing and labeling luncheon meat, franks and bulky products, with heat sealing films. Equipment maintains flow of product and supply of wrapping film, and operator wraps product manually. Circle No. **163.**

Automatic Wrapper

Schooler Manufacturing Co. has a 4-page folder on its automatic wrapping machine which handles cellophane, wax or foil, plain or printed. Standard model is adjustable to package sizes ranging from 2½ to 12 in. long, 1⅝ to 7½ in wide, ¾ to 2½ in. high. Changeover time is one min. Unit seals on longitudinal seam, leaving top and bottom panels unbroken. Circle No. **164.**

Can Line Equipment

B. F. Gump offers a brochure describing its "Auto-Check" can line equipment which automatically feeds, fills, packs and ejects cans. There are eight models designed for dry, crystalline and powdered materials. Circle No. **165.**

Rotary Vacuum Filler

Climax Products Div. of Lodge & Shipley offers a brochure on its sanitary liquid rotary vacuum filler. Designed for small containers, filler adjusts to rates of 100 or more containers/min., with liquids of varying viscosity. Circle No. **166.**

Metal Corner Stay Machine

Cincinnati Box and Partition Co. offers a brochure on its metal corner stay machine. Features include: self-setting safety, 17-in. throat depth, adjustable foot treadle, hinged removable work table, and self-lubrication. Manufacturer says machine is jam proof and easy to reload. Circle No. **167.**

Vacuum Filler

Climax Products Div., Lodge and Shipley Co., offers a 4-page brochure on its liquid rotary vacuum filler, which fills a variety of container styles up to 4-oz. size with liquids of varying viscosity. Adjustable to rates of 100 or more containers/min., machine is designed specially

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for accurate fill of small containers. Feed, fill and discharge are completely automatic. Circle No. **168.**

Bag Making Machine Attachments

G. T. Schjeldahl Co. has a 4-page brochure, A159, on various attachments for bag making machines. Included are liquid tight sealer for leakproof bags, gusseters, and perforating and lip-folding attachments. Circle No. **169.**

Powered Strapping Machine

Acme Steel Co. offers a brochure on its model F4 powered strapping machine. Whatever the size of the package, the F4 tightens each strap to a uniform tension, with dial adjustment, then seals and cuts it. Seals are fed from coils which may be printed in color with trade mark or identification, and 3000 to 5000 seals are made from each coil. Strap feeding and tensioning are electrically powered; sealing and strap cutting are pneumatically powered. Circle No. **170.**

Flexible Urethanes

Nopco Chemical Co. offers a 16-page booklet giving basic physical and chemical data on both polyester and polyether types of "Nopcofoam," flexible urethanes. Impact absorption, shelf exposure, absorption capacity and flammability are a few of topics covered. Circle No. **171.**

Protective Wadding

Stearns & Foster Co. has a 6-page brochure with samples and data on four types of "Packit" wadding for surface protection and cushioning of appliances, instruments, furniture, machines, and so on. Circle No. **172.**

Cushioning Material

Flex-O-Lators, Inc., Edg-Pak Div., has a progress report on a variety of applications of its cushioning material. Sample piece of "Edg-Pak" is included and a cutaway diagram showing its design and protection performance properties. Photographs show nesting, packaging and critical edge protection in automobile, aircraft, missile and other industries. Circle No. **173.**

Can Imprinter

Charles Beck Machine Corp. offers a data sheet that describes its can imprinting machine. Imprinting color, name analysis, batch number, and so on, this unit gives printing results equal to lithography, says Beck. Handles filled or empty cans from ¼-pt. to 1-gal. in size. Circle No. **174.**

Moistureproof Multiwall Bags

Union Bag-Camp Paper Corp. offers an illustrated 4-page brochure on its moistureproof multiwall bag, "Uniseal." A flat tube made in two or more plies, it is constructed with a polyethylene-coated inner wall which is heat sealed inside. This airtight, watertight bag is suitable for shipping semiliquids, food products and hygroscopic chemicals. Circle No. **175.**

Baler-Bagger Machine

Tele-Sonic Packaging Corp. offers literature describing operation and specifications of its soft goods baler-bagger. Machine provides tight-to-product poly bag fit for soft goods products in wide range of sizes. Operating semiautomatically, machine is capable of speeds of 500 to 1,000 baler packages/hr. Circle No. **176.**

Corrugated Box Ideas

Hinde & Dauch offers an illustrated 32-page booklet, "How to pack it in H&D corrugated boxes." Picturing 74 styles of corrugated boxes, each designed for a special purpose, the booklet tells where and why each type should be used. Circle No. **177.**

Bag Ejector

Richardson Scale Co. offers Bulletin 2549A describing their bag ejector which automatically transfers filled bags from a bag table onto a bag sewing conveyor belt, making it possible for one man to handle weighing, packing and sewing operations. Components include Model GGG-38 scale, Model MSM Pneumatic Auger Packer, automatic bag ejector and bag sewing conveyor. Circle No. **178.**

Imprinting Machine

Van Buskirk and Co., Inc. has a leaflet on its model H-18 flat carton imprinting machine. Maximum imprint width, 4¾ in.; maximum length, either 6 or 13½ in., selected by switch on control panel. Automatically prints paperboard and chipboard flat and glued flat cartons, die-cut cards or inserts fed from magazine with a bottom-feed variable-speed, vacuum pull-down arm. Circle No. **179.**

Colorimeter

Instrument Development Laboratories, Inc. offers a 4-page brochure on its "Color-Eye Model D," which combines a colorimeter with an abridged spectrophometer. "Color-Eye" measures color differences, as small as 0.1 per cent in light and dark colors for solids or liquids and indicates differences in numerical values. Schematic drawing of instrument in included. Circle No. **180.**

Cushioning Material

Preservation Packaging, Inc. offers a technical bulletin on its combination package wrap and cushioning material that absorbs motion, shock and vibration. Called "Zylex" 6, it features resilient thermoformed protuberances evenly spaced for maximum protective qualities. Each of raised cylinders acts as an independent spring cushioning at points of contact; there are approximately 1,000 cylinders/sq. ft. Some advantages—can be heat sealed into bag for shipping delicate parts or fabricated into tray liners to absorb shock and vibration of parts being moved from one place to another in shop; is nondusting, noncorrosive, nonabrasive and chemically resistant to acids, alkalies, organic solvents; will not absorb moisture. Circle No. **181.**

Cellophane And Polyethylene Bags

The Dobeckmun Co. offers a 16-page catalog, "Dobeckmun stock bags," a reference for determining type, size, loading method and closure suitable for a range of products such as baked goods, candy, hardware, produce, flowers, meat, poultry and textiles. Types and sizes of ready-made bags available are shown in some of their more popular uses with detailed specifications. Circle No. **182.** (End)

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For more information circle No. 272 on Reader Service Card, Page 83

Structural design notes for corrugated containers

Note No. 11: Compressive strength of boxes-Part I

By K. Q. Kellicutt, *Engineer, Forest Products Laboratory, Forest Service, U. S. Department of Agriculture, Madison, Wisconsin*

More and more compressive strength is being built into corrugated containers to enable them to withstand the constantly increasing loads imposed on them as packaged goods are stacked to greater heights. The additional strength is gained by using heavier and better paperboards in the corrugated structure, better adhesives for bonding the paperboards together, more uniform spacing of the liners in the board, and improved techniques of scoring the corrugated material.

In addition, increasing use is being made of multiwall structural material in order to satisfy the need for high strength. For example, with regular-slotted, triple-wall corrugated boxes, it is possible to develop top-to-bottom compressive strength in excess of 4½ tons for a single box (*7*). Yet the users of corrugated containers are demanding even greater strength, and the manufacturers of the containers are continually striving to develop stronger boxes to meet the need.

Compressive Strength

The factors that account for the strength and stiffness in a corrugated container, and those that adversely affect its strength are taken up in this and subsequent notes.

The compressive strength of a corrugated container is dependent on a number of factors. The most important are, of course, the physical properties of the paperboards from which the box is made (*3*). Not only is it important that the physical properties of the paperboards be appropriate for the intended end use, but **the arrangement of the paperboards in the built-up board is essential for attaining the optimum moment of inertia** (*6*) **and in turn, bending stiffness. The arrangement is especially important with the multiwall boards; greatest stiffness is attained by designing so that the heavier paperboards of the structural material are as far as possible from the neutral axis.**

Even though consideration has been given to the appropriate materials and arrangement, it is well known that two lots of boxes of the same design, made from the same paperboards, and with a specific flute may show widely different results in the compression test because they have been treated differently in the manufacturing process. For instance, in converting corrugated board into boxes, one of the operations that has a large influence on the resistance of the box to compression loads is scoring or creasing to form box edges.

Influence Of Score

In experimenting with three depths of scores—light, medium, and heavy—**Carlson found not only a difference in maximum loads attained with different depth of score, but also a different rate of falloff after maximum load had been reached** (*2*). For example, with the lightest score that could be made on a rotary creaser without resulting in visible cracks when the flaps were bent into place for sealing, the boxes had the highest compressive loads and showed the smallest amount of compression (less than ½ in.) before reaching their maximum load. However, the boxes having the light score fell off more rapidly in resistance to crushing once the maximum was reached.

Those with a heavy score—the deepest that would not show cracks immediately after scoring or when the flaps were bent into place—did not attain their maximum compressive strength until they had been crushed down about ¾ in. The extent of compression at maximum load for boxes with the medium score, midway in depth between the light and heavy, was between the values for the boxes with light and heavy.

One of the most important aspects of the relationship between depth of score, extent of compression, and maximum load is that it provides a means of fabricating a box for specific uses. For example, scores of light or medium depth are essential if only small amounts of compression can be tolerated because of the nature of the contents of the box.

Reduction In Strength Due To Score

The ideal score would be one that avoids the crushing or rolling at the top and bottom edges of the box, so that the force would be absorbed directly by the side and end faces. If this could be accomplished, a box could attain the same compressive strength that is indicated by a tube (*4*).

The tube test indicates the inherent strength and stiffness existing in the material, and may be set up as a goal toward which scoring or creasing operations should be pointed. Generally, a box will attain a maximum compressive strength in the top-to-bottom direction which is about 70 per cent of that attained by a rectangular tube made of the same material and corresponding in size and shape to the box. This 70-per cent value was established as an average value based on literally thousands of tests of commercially made boxes and tubes cut from them. **This relationship was designated as a box factor** for use in predicting the compressive strength of corrugated containers from ring-crush values of the component paperboards (*5*). Angell and Paslay have suggested it be designated as a "flap coefficient" after experimenting with it in their work (*1*).

Although the 70-per cent value fairly well represents an average, it was found during tests that a few boxes with poorly made scores attained as little as 54 per cent of the tube load. At the other extreme, one lot of triple-wall corrugated boxes attained as much as 94 per cent of the tube load, indicating a highly efficient score.

Other Factors

In order that corrugated board develop sufficient strength for use as a container material, the bond between the component paperboards of the structure must be continuous throughout the board. Glue skips, resulting from insufficient adhesive or poor tackiness, reduce the box strength appreciably, as do the finger lines where glue may be thin.

Actual examples will be given of the effect of faulty gluing along with the effect of moisture on compressive strength next month.

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(7) *Research bases for a compressive strength standard for triple-wall corrugated boxes* (Madison, Wisc.: U. S. Forest Products Laboratory), unpublished report, December 19, 1958. (*End*)

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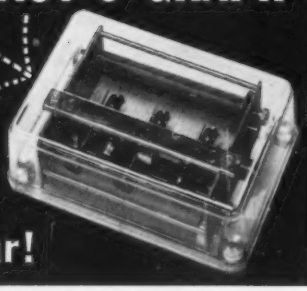

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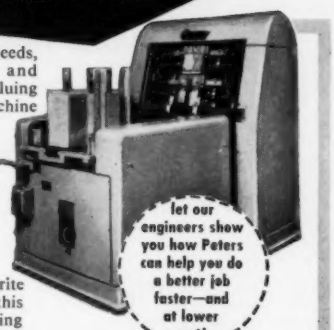

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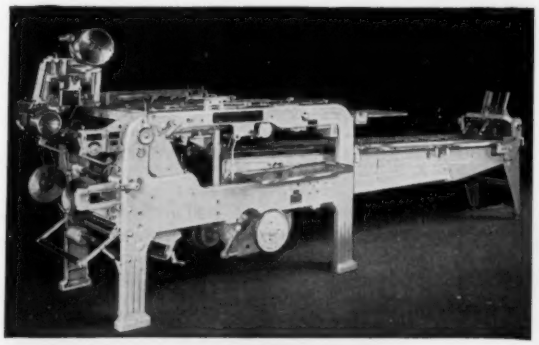

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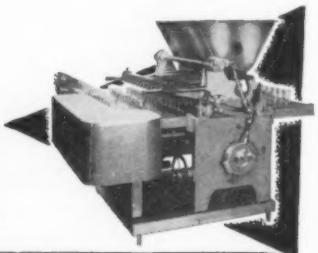

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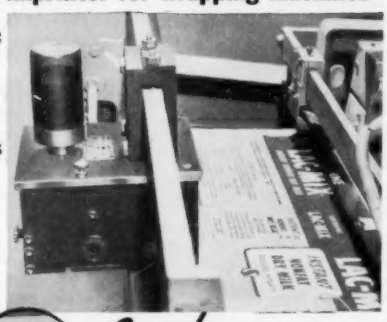

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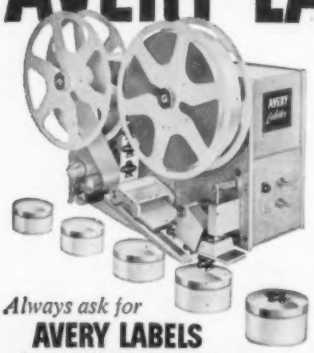

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What we think

Is your thinking flexible enough for tomorrow's tasks?

Now that the long-awaited "60's" are practically here, it is time we draw some order out of the vast disarray of opinion thrown at us during recent months concerning all the changes the coming decade holds for our business life. If but a few of these predictions approach anything like fulfillment, the packaging man is in for a tough time unless he orients himself to a new way of thinking.

We say "packaging man" advisedly, because we are especially concerned for those one-man packaging teams in our thousands of smaller companies. We hear so much about the progress of the smoothly-coordinated technical and operational packaging teams in our big, nationally-known companies that we momentarily lose sight of the unsung hero of packaging—the man who must do the job pretty much by himself, whether he be engineer, coordinator or manager.

A man alone facing a fast pace

The breadth of his job came into focus one evening several weeks ago during a "grass roots" engineering institute on packaging at The University of Wisconsin. A few moments' solitary stroll hotelward, watching the sun slip behind the trees on the far shore of Madison's Lake Mendota, reminded us that the one-man packaging group is just as alone during most of his hours on the job as any lonely wanderer watching the ripples of a lake at nightfall. But while he stands alone, his position is far from unique.

One aspect of our concern is that the small company packaging man's job differs only in degree from that of his large company counterpart: he does himself all the things a number of people do in a larger packaging organization. Therefore, he typifies the problem facing packaging today. More serious from his standpoint, however, is that every indication points to the accelerated pace of the 60's having greater immediate impact on the small company.

The packaging man's problem stands in sharp relief when we look at what is happening to manufacturing itself, i.e., to the *making* of what our man has to package. Sensitive observers of the business scene point to greater interest in any company having a wider range of products. It appears that many products will produce profits for a limited time only. Thus, we hear that more companies are having to spend more money to develop new products.

Another interesting point is the change we see in the concept of time: experts warn us of the importance of lost time being just as real a waste as loss of material—something to reduce to minimum. They remind us that more companies (small ones, especially) will face tighter timetables and have to speed up the transition from one item to another.

All this drives home the importance of a packaging man fitting a new concept of flexibility into his thinking if he is to function fast enough to accomplish his job on schedule. Reducing this "flexibility" to concrete terms, we see him having to be ever more selective in how he applies his efforts. This in turn boils down to the question of just how much background he needs about any one phase of packaging: how much should he know about folding cartons? How much information about, say, polyethylene, is "enough"? How can he anticipate his company's packaging needs—in time?

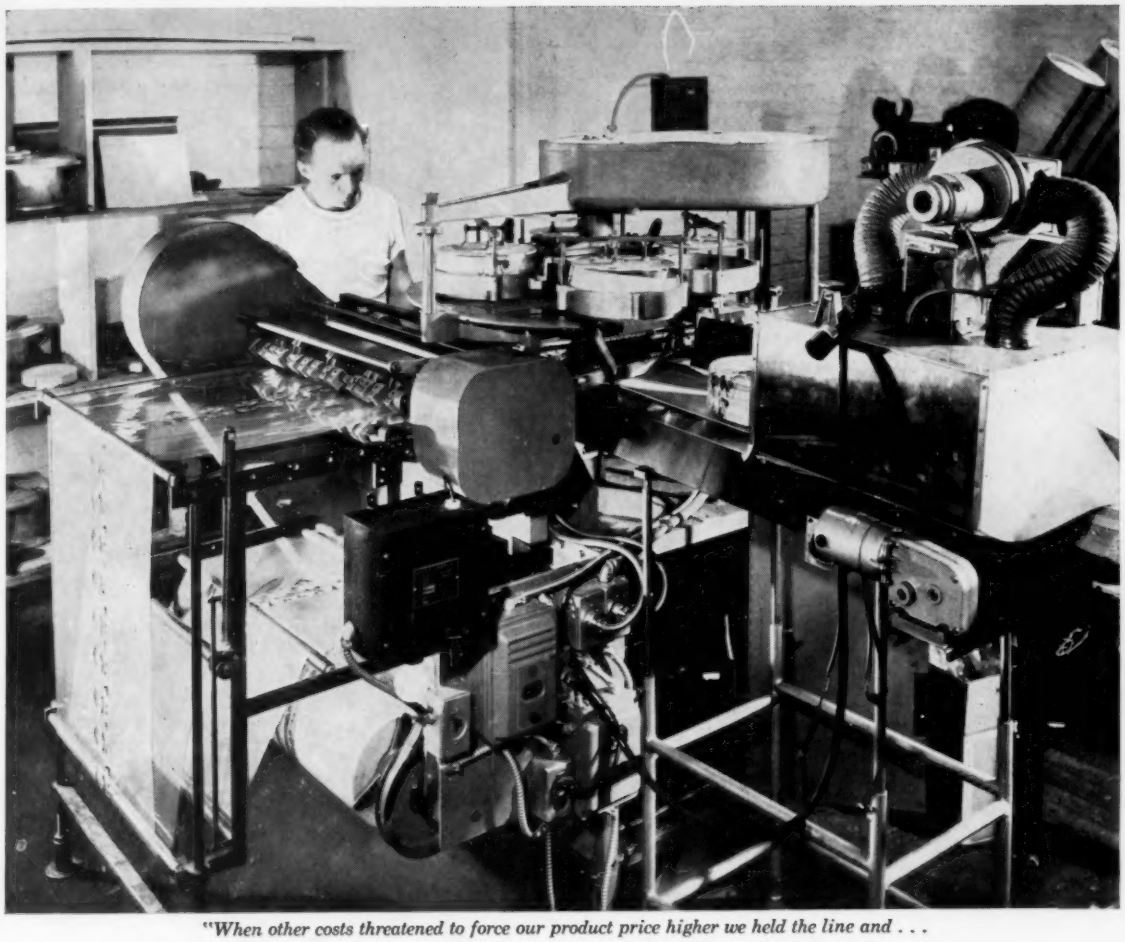
Quick adaptability: a vital attribute

Some packaging people find all this a bewildering and frustrating experience—not only to master the fast-moving technical details of their work, but also to sell a program to top management men who may not be especially appreciative of packaging. More find it a fascinating and dynamic challenge. If a man isn't self-reliant and resourceful when he takes on a solo packaging assignment, he gets that way fast. And in doing this, he develops a knack of selecting items to study, particular package forms to explore, special trends to note.

Talking to some of these packaging specialists who have each acquired the equanimity to run a one-man show in a small company encountering abrupt product changes (and without panicking) convinces us that the reason they can do it is because they have honed their thinking tools to a point where fast changes and crash programs are entirely normal.

Bruce Hollingren

Editor



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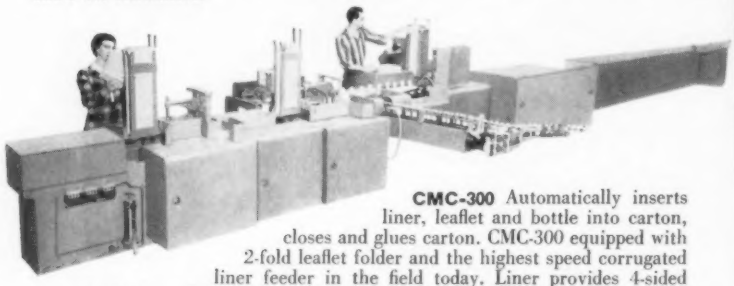

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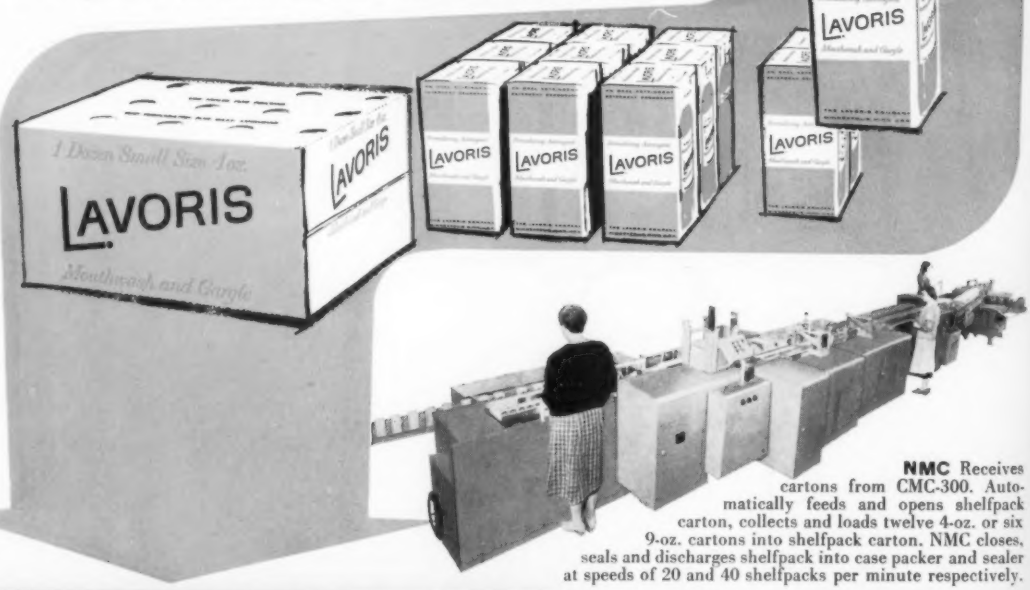

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